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SOME NOTES ON GREENWATER

The New Copper District of California — Its Developments and Prospects

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The Greenwater mining district is located in Inyo county, southeastern California. (See map.) It is bounded by the Echo cañon mining district on the north, Nevada on the east, the Resting Springs mining district on the south, and Death Valley on the west. The district, roughly speaking, covers an area of 25 by 45 miles.

GENERAL GEOLOGY

From exposures seen near Rhodes' Well, in the southern part of the district, the main core of the range appears to be granite and gneiss, also some crystalline schists. This is broken and largely covered by later rhyolite, andesite and basalt flows, which conceal the granite except in some of the deeper cañons and washes. A succession of rhyolite and andesite flows have covered one another with great iregularity, though in some case the rhyolite is the younger of the two. Rhyolite tuffs and volcanic breccias are common. Pitchstone was found in place in some of the rhyolite tuffs, and obsidian occurs in the district. Basalt is the youngest of the volcanic rocks, and as a rule covers the other flows. Limestone is found in some parts. The Grapevine range to the northeast of the Funeral mountains is largely limestone, and has also its share of eruptives.

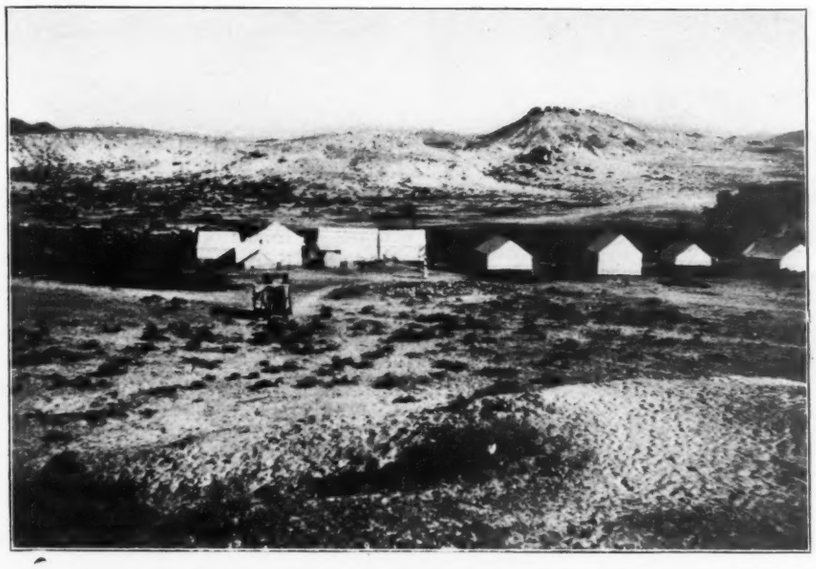

FIG. I. ASH MEADOWS, LOOKING NORTH

MODES OF ACCESS

Greenwater is reached from Salt Lake City by the San Pedro, Salt Lake & Los Angeles Railroad to Los Vegas, and the Los Vegas & Tonopah Railroad to Amargosa. From Amargosa, a stage makes the trip daily to camp, a distance of 48.6 miles by the wagon road. Another route is by way of the new Borax Smith railroad (Tonopah & Tidewater Railroad), now being built north from Ludlow, a station 44 miles east of Daggett (Cal.), on the Santa Fé. The Borax Smith is within 40 miles of Greenwater, and is being built with all speed possible. A stage line connects the end of the road with Ramsey, and this route is both cheaper

At the present time most of the copper discoveries are included in an area six miles east and west by 18 miles in a northwesterly direction. The center of activity is spoken of as Greenwater, comprising the three camps of Kunze, Ramsey and Clark. These camps are in the main ridge of the Funeral range, a chain of mountains extending northwest in three or more nearly parallel ridges. The Grapevine mountains and Amargosa desert are on the north and east, and the range rises abruptly from Death Valley on the west. Death Valley, in places, is 370 ft. below sea-level. On its western side the Panamint range rises to a hight of over 12,000 ft. The general direction of the Greenwater ridge, separating the Furnace creek valley from Death Valley is N. 30 to 40 deg. W. The slope is gradual on the Furnace creek side and steep toward Death Valley. The summit of the range reaches an altitude of 5000 to 6000 ft.

FIG. 2. LARGEST FREIGHT WAGON ON THE DESERT

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and quicker than from Amargosa. Greenwater can be reached from Tonopah in 15 hours by automobile. There is talk of the Brock-Goldfield railroad system entering the district, but little definite information about this can be had.

At present all freight comes in by way of Amargosa, and is hauled via Ash Meadows over sandy roads to Greenwater.

FIG. 3. KUNZE, LOOKING NORTHWEST

Amargosa or Johnnie Siding, as it was formerly called, is on the Los Vegas & Tonopah railroad, 50 miles from Rhyolite, the end of the line. Water has been obtained here by boring. The town is mostly of tents with the exception of the depot and freight buildings, and presents a lively appearance with its large freighting wagons and teams.

Arriving on the afternoon train at Johnnie Siding, you take your place, if you are lucky enough to obtain one, in the six-mule stage coach, and are off about dusk for Ash Meadows, a distance of 12 miles. The stage fare to Greenwater is $18 one way, or $32 for the round trip; 50 lb. of baggage is allowed. The night is spent at Ash Meadows or at Longstreet's ranch, a mile and a half farther on. The freight wagons stay at Ash Meadows, and good travelers' accommodations can be obtained there, at Fairbank's.

ASH MEADOWS

Ash Meadows is of importance as the real starting point for Greenwater, and on account of its large springs. The water flows from two main holes, 5 to 8 ft. deep, in the calcareous country rock. The water contains very small quantities of alkali, no cloudiness being observed by the addition of citric acid. Small quantities of borax are said to be in solution. The water is luke-warm. The flow is constant, varying little between summer and winter, and has been variously estimated at from 170 to 220 miners' inches. This ground has been secured for water rights by a Tonopah company, Judge L. O. Ray and associates, and it is proposed to establish a pump line and pump the water into the copper camp. The distance by the road from Ash Meadows to Kunze is 36.6 miles and for a pipe line would be considerably less. The difference in altitude is 2340 ft.

The surface rock in the neighborhood of the springs and for a considerable distance surrounding appears to be a deposit of calcareous sinter, or travertine. Fig. 1 is a view of Ash Meadows, looking north, and shows tents, wagons, springs, etc. It is probable that following the great volcanic period in this region, the springs were especially active. North of the camp is a deposit of sinter, shown in the photograph, forming a butte many feet higher than the present surface. The sinter is in irregular layers and full of cavities. It was undoubtedly deposited by the present Ash Meadows springs at a time when they were heated by some of the igneous intrusions; the springs are slowly cooling. Pebbles which show cracks from drying are found, showing a similarity to the silicious sinter at the lower geyser basin in the Yellowstone. This deposit is said to be 90 per cent. lime. A test on a piece of the rock shows strong effervescence with hydrochloric acid, and some trace of gelatinous silica. The deposit has been reserved for flux for the proposed Rhyolite smelter to be erected at Ash Meadows.

MEANS OF TRANSPORT

Freightage from Johnnie Siding to Greenwater costs $60 a ton, whether to Kunze, Ramsey or Clark; to Willow Creek it is about $65 a ton. It takes seven to eight days for a freighter to make the round trip. One of the large teams of 12 horses can carry about 7½ tons, beside their feed and water. Hay costs $40 a ton and grain $2.50 a sack of 80 lb. at the siding. The approximate cost to the teamster per horse per day is $1.50. For a team hauling about 7½ tons the net receipts for a week's trip are over $300. Teams of four up to 22 horses or mules are used.

Fig. 2 shows the largest freight wagon on the desert, with the exception of one belonging to Borax Smith, in Death Valley. Mr. Fairbanks in the picture is 6 ft. 2 in. and shows relatively the great size of the wagon. The axle is 4½ in., tires 6 in. and diameter of back wheel is 6 ft. 8 in. This wagon is owned by the Tonopah Lumber Company and used for hauling large machinery, hoists, etc., to Greenwater. It will carry any load that can be put on it and requires 22 horses to haul. It may be of interest here to note that the 25-h.p. gasolene hoist hauled in for Patsey Clark's Furnace Creek Copper Company, weighed 13,000 lb., and this was put on the ground without trouble or injury

FIG. 4. OLD HEAD-FRAME, COPPER GLANCE NO. 2 SHAFT

to the machnery. The 50-h.p. hoist being installed on Schwab's Copper Queen No. 2 shaft weighed 23,800 lb., and this is safely on the ground.

The road from Johnnie Siding to Ash Meadows is sandy, but good. Automobiles make the trip to Greenwater every day. It is 40 miles from Ash Meadows to Beatty and Rhyolite over a sandy road and takes three days for freight teams. Before the railroad reached Beatty all the freighting was done by teams from Los Vegas, a distance of over 80 miles. With good luck the teams could make two trips from Las Vegas to Beatty in a month. At present no freighting is done from Beatty to Greenwater, the haul being shorter from Amargosa.

FIG. 5. COPPER QUEEN NO. 2 SHAFT

The following table of distances and elevations from Ash Meadows to Greenwater was taken with an odometer by P. J. Maguire, chief engineer of the Clark railroad, in October, 1906:

	Elev. Ft.	Dist. Miles.
Ash Meadows	2,370	0.0
Longstreet's Ranch (Ash Meadows)	2,370	2.4
Watkins Ranch	2,320	6.0
Skeleton Mountain Wash	2,170	8.0
Amargosa River	2,000	11.5
Fairbanks Well No. 2	2,000	13.4
Kelly's Well (Struck Water at 130 ft.)	2,130	16.5
Dry Station in Cañon	3,170	26.9
Summit	3,780	31.0
Kunze's Camp, Greenwater	4,710	36.6
Johnnie Siding (Amargosa) to Ash Meadows		12.0
Ash Meadows to Fisk's Well No. 2, via Longstreet's Ranch		13.4
Ash Meadows to Kelly Station via Freight Road		8.4
Kelly Station to Fairbanks No. 2 Well		4.3

It will be seen that there is a difference of elevation of 2340 ft. between Ash Meadows and Greenwater, in a distance of 36.6 miles. There are no heavy grades and were it not for the deep sand on the Amargosa desert, and lower part of Dead Horse cañon, it would not be a difficult haul. At it is at present, with lack of water, horses sometimes die on the way.

From Ash Meadows to Greenwater, the general direction is southwest. By leaving Ash Meadows in a light two-horse rig in the morning, it is easily possible to make Greenwater before sundown. The freight road to Kelly's Station, across the Amargosa desert is sandy and level. Greesewood, Brigham Tea, some sage brush and mesquite, are the only vegetation. Where the mesquite grows, the sand collects and forms dunes in places fifteen to twenty feet high.

The Grapevine mountains rise from the west side of the desert and Amargosa wash is entered near Kelly's Station. Kelly's well here struck water 6 ft. below the surface; the Amargosa river underflow is from 4 to 10 ft. below the surface, and water can be obtained nearly anywhere by digging.

The next station is Fairbank's well No. 2, 4.3 miles from Kelly's. Water can be obtained here at moderate cost. The well is about 30 ft. deep. Leaving here, the road swings more to the west, and the next station is Kelly's dry well, about four miles distant. The dry bed of the Amargosa river trends southeast and passes Eagle mountain, a lone peak rising steeply from the desert; some distance to the south, it turns westerly around the south end of the Funeral range, north into Death Valley.

Kelly's dry well, elevation 2130, struck water at 130 ft. depth, showing the Amargosa water level in this neighborhood to be close to 2000 ft. elevation.

The road now passes over boulders of basalt float in the wash from the south end of the Grapevine range and enters Dead Horse cañon. The Lila C. borax mine is about two miles south of the road in the foot hills just before entering the cañon. Over seven miles of development work has been done here, and the Lila C. mine was Borax Smith's objective point in building his railroad from Ludlow. The pull up Dead Horse cañon to the dry station is a hard one. The cañon cuts through rhyolite and andesite flows and rhyolite tuffs and volcanic breccias in places covered by later basalt flows.

At the dry station, water may be had at $1.50 a drink for two horses. A tent saloon, the stage-line station and water tanks are all there is in sight. This is one of the stop-over points, and is 10 miles from Greenwater. The cañon turns sharply to the left above here and the summit is reached about five miles from the dry station. A large basalt flow covers the hills to the north at this point.

FIG. 6. HEAD FRAME AND ENGINE HOUSE ON COPPER MATTE CLAIM

The road to Greenwater from here is good though there is a rise of 1000 ft. to camp. About a mile beyond the summit is passed the old stage road to Dagget, leading to the southwest. Ramsey is the first camp. It lies to the west of the main road on a flat gentle slope leading to the Death Valley divide. Kunze, the cen-

tral camp is 1½ miles by road west of Ramsey. Clark is a mile from Kunze, farther to the northwest.

KUNZE

The town of Kunze is located in a small gulch close to the largest properties at an altitude of 4700 ft. It is a hard place to bring water and supplies, resulted from pneumonia. Kunze is in the center of the mining ground.

KUNZE MINING DEVELOPMENT

The Greenwater and Death Valley Copper Company (Schwab's company) has 16 claims in a group to the south and east of town.

The Copper Glance No. 2 shaft is being sunk in the wash, south of the post office; this shaft, whose surface accessories are shown in Fig. 4, is down 125 ft. vertically. The Copper Glance ledge strikes N. 15 deg. E. (true) at the shaft and dips 75 deg. east. The surface showing is good, with an outcrop 6 to 10 ft. wide in the cañon. It is an iron-stained silicious ledge, and from 5 to 8 ft. has strong malachite and chrysacolla staining. The shaft was sunk with a horse whim and struck the ledge at 90 ft. A new Fairbanks-Morse 25-h.p. gasolene hoist is being installed. The hanging wall of the ledge appears to be andesite, and the footwall rhyolite. The cañon here marks the contact, and the color difference between east and west side is marked, rhyolite being on the west.

Across the gulch from the shaft are old workings 10 to 15 ft. deep; the ledge shows plainly here and can be traced northeast toward the Copper Queen No. 1 shaft. In the saddle of the ridge northeast of Copper Glance No. 2 is a prospect shaft, sunk 20 ft. on a ledge and all in ore. The ledge strikes N. 50 deg. E., dips 80 deg. E. and has andesite foot and hanging. A heavy iron-stained cropping lies to the northwest about 50 feet.

Schwab's Copper Queen No. 1 shaft, on ground formerly owned by Kunze, is northeast of Copper Glance No. 2 and on the same ledge; it is some 300 yards east of town.

A 15-h.p. gasolene hoist is being installed here; the shaft is about 80 ft. deep on the ledge, but is vertical and leaves it here, the ledge dipping to the north. There is about 2 ft. of solid ore in the bottom of the shaft, and a fine showing on the dump, said to run over 22 per cent. copper. Malachite and chrysacolla are the chief copper minerals. Barytes occurs plentifully with calcite and quartz as vein minerals. The ledge can be followed east down the gulch from No. 1 Copper Queen, striking almost east and west. The north side of the gulch is whitish rhyolite, as near as can be determined in a hand specimen, but a calcite veinlet, which has been found, suggests a lime-soda feldspar and the rock may be a light-colored andesite instead of a rhyolite. For convenience, the rock will be spoken of as rhyolite. It is younger than the andesite on the south side of the gulch, and contains rough angular fragments of the latter, over a considerable distance along the contact.

FIG. 7. FROM THE DIVIDE BETWEEN FURNACE CREEK AND DEATH VALLEY

and it would be a great expense to build railroads there. The owners of the townsite are considering moving the town to Ramsey, 1½ miles to the east. Ramsey has a better location for a town and is more accessible for teams and railroads.

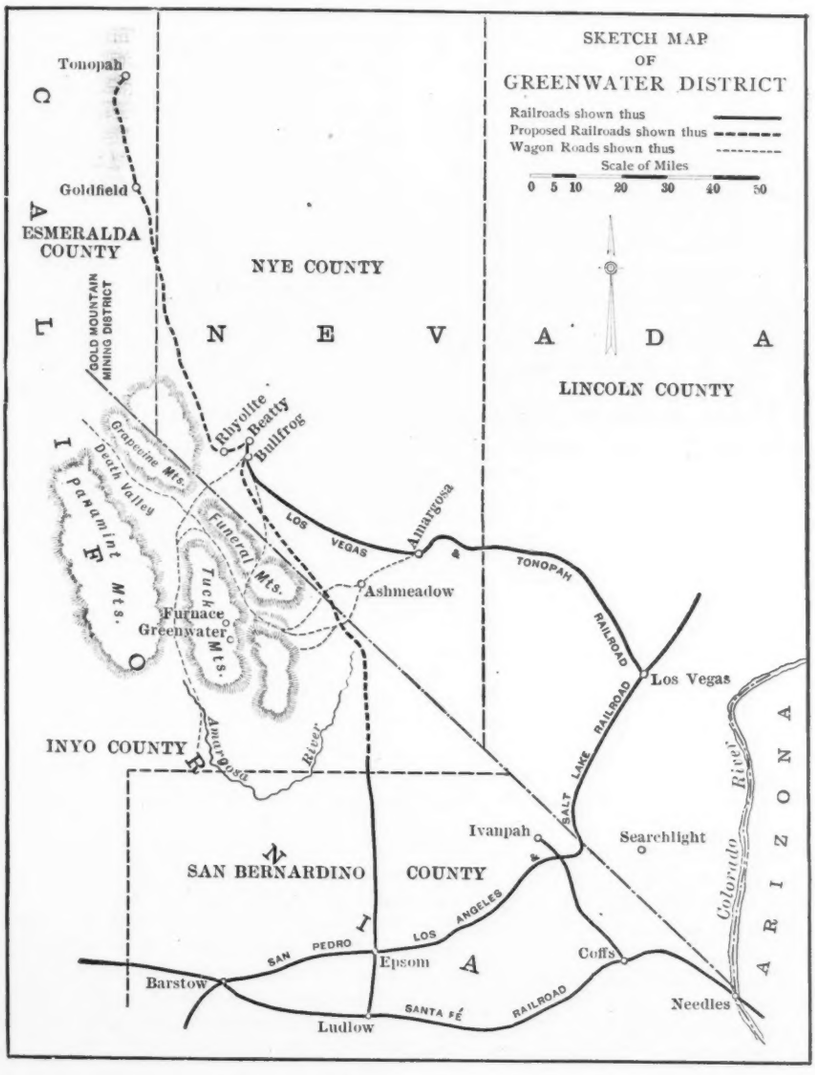
Water in Kunze all comes in by wagon; it ranges in price from $7.50 to as high as $30 per bbl. The townsite owners aim to supply it as cheaply as possible. Mr. Salisbury, of the Tonopah Lumber Company, has three teams hauling, and by selling water at $7.50 per barrel claims that he loses about $200 a team a month. When water supply cannot fill the demand, which frequently happens, prices rise, and $10 is quite common. Coal sells from $85 to $90 a ton.

Most of the dwellings in Kunze are tents, though several large frame buildings are in course of construction. Fig. 3 is a view of Kunze looking northwest toward Furnace creek. Funeral range is in the background. The town has 400 to 500 inhabitants. A newspaper, the *Greenwater Times,* is published weekly and a post office has been established, and the town has an air of life and bustle. Everything is expensive in Greenwater; but, considering the distance and difficulties, meals and beds at 75c. each are not expensive. Miners can board for $1.50 a day. There are about 200 men employed in camp; wages are from $4.50 to $5.50 per day—$5.50 underground. There is little sickness in camp, though one death has

FIG. 8. COPPER DISCOVERY NEAR RHODES' WELL

The cañon follows the contact, but the Copper Queen ledge is on the south side and sometimes cuts across the andesite, having here andesite both in foot and hanging. In the small north and south gulch, just west of the Copper Queen No. 2, the ledge is exposed in an open cut on a N. 75 deg. E. fissure, dipping 85 deg. north. Malachite and chrysacolla ore, 2 ft. wide, is exposed, with some hematite.

The Copper Queen No. 2 shaft is inclined 70 to 80 deg. north and follows the ledge. The shaft is all in ore, 6 ft. wide.



Malachite, chrysacolla and hematite form the ore, with occasional chalcocite. The shaft is down 65 ft., and has 8 in. of chalcocite in the face at bottom. A specimen illustrating gradual oxidation and alteration from the original sulphide showed a black chalcocite kernel in the center, surrounded by a red cuprite layer, and this in turn enveloped in malachite and chrysacolla. At this depth, 65 ft., the occurrence of chalcocite would indicate that sulphides will be found in quantity at no great depth. Oxidation seems to be superficial and sulphides have been found at various places on the surface. A new 50-h.p., Fairbanks-Morse gasolene hoist is on the ground, and will soon be in operation. This is the largest hoist in Greenwater at present. The ledge east of the shaft follows the contact of rhyolite and andesite, and in places outcrops 20 ft. wide. Barytes, calcite and quartz are the gangue minerals. In places, 2 ft. of solid barytes are exposed on the outcrop, with copper staining as a rule along the foot wall side. Fig. 5 is a view looking west up the gulch, and shows Copper Queen No. 2 shaft, with windlass and ore pile in the foreground; the rhyolite hill is to the right and andesite is to the left. Copper Queen No. 1 shaft is just over the pass to the west.

Copper Queen No. 5 is located ¼ mile to the south in the north and south gulch leading from Copper Queen No. 2. The shaft is down 80 ft. on a ledge which outcrops from 5 to 15 and 20 ft. or more wide. The strike is east and west, and dips 75 deg. south. An open cut is driven south into the ledge from the cañon, and the shaft is sunk in a copper-stained zone 6 ft. wide in face of cut. Malachite and chrysacolla are the chief minerals; some barytes float was found in the gulch above the shaft, but no chalcocite was noted. The outcrop can be followed both east and west from the shaft across the cañon to the summit of both ridges. The zone of strongest copper staining is 10 to 15 ft. wide. On the ridge east from No. 5 shaft, across the gulch, a prospect shaft is down 25 ft. on the ledge, and exposes fine chrysacolla ore. On the surface by this shaft, solid chrysacolla, 4 to 6 in. thick, was seen.

CLARK

The Furnace Creek Copper Company (Patsy Clark company) is located about a mile west of Kunze; the main shaft is on the Copper Blue claim at an altitude of around 5200 ft. The shaft is vertical and 290 ft. deep; the ledge is in andesite and strikes about N. 30 deg. E., dipping 65 to 70 deg. east; the outcrop is not prominent. Shaft No. 2 is sunk on the ledge about 600 ft. southwest of the main shaft, on the Copper Matte claim. It inclines 65 deg. to the east. Fig. 6 is a view looking east, and shows the head frame and engine house of the main shaft. A 25-h.p gasolene hoist has been installed.

Fig. 7 is a view taken from the divide between Furnace creek and Death Valley, at an altitude of 5600 ft. Kunze lies in the center at the foot of the dark mountain.

The main Clark vertical shaft on the Copper Blue claim is down 290 ft., and a cross-cut from the 250-ft. level shows the ledge to be 35 ft. wide at this point. A Fairbanks 25-h.p. gosolene hoist is used. The upper shaft is down 80 ft., and is in good ore. On the dump, solid chalcocite and malachite 2 in. thick was found. This is a partial alteration of chalcocite to malachite, and occurs as an intimate mixture. There are three open cuts to the west of this shaft, and all have strong copper showing.

On the dump of the main shaft may be seen pieces of solid chrysacolla 1 to 2 ft. thick, also lumps of chalcocite and malachite, 12 or 18 in. through. Apparently some black oxide of copper, possibly tenorite, occurs with the chrysacolla. No cuprite was noted. The chief minerals here, as in the rest of the camp, are chrysacolla and malachite; some partially altered sulphides occur in varying amounts. There is a noticeable absence of azurite.

The Clark townsite has been moved from near the main shaft lower down the slope to the north, on ground covered by the several Copper Blue claims. Water is hauled at a cost of less than $6 a barrel from Furnace creek, 18 miles distant. The new town will be called Furnace. At present a number of interested companies have made arrangements for a single boarding house to accommodate their employees. There are already two business places on the ground and town lots command a premium.

To the northwest of Clark, valuable ground is being developed. On the Clark

Copper Company's property a 12-ft. shaft has opened up 3 ft. of high-grade ore, and other properties in this direction have some good surface showings. The following is a partial list of Greenwater companies: Furnace Creek Copper Company, Furnace Valley Copper Company, Furnace Creek Consolidated Copper Company, Greenwater and Death Valley Copper Company, Greenwater Bimetallic Copper Company, Greenwater Black Jack Copper Company, Greenwater Pay Copper Company, Greenwater Copper Mining Company, Greenwater United Copper Company. Others are rapidly being incorporated.

RAMSEY

Ramsey lies about 1½ miles east of Kunze. It is situated in a better place for a town than Kunze, being located on a gradual incline, and on relatively level ground; it is also easily accessible for freight and railroad. Mr. Salisbury, who has taken over the Ramsey townsite, has offered to all property holders in Kunze an equally good lot in Ramsey, and he will pay all costs of moving. Should this be settled on, Ramsey will be the chief town of the camp, and will be known as Greenwater.

The population of Ramsey, Nov. 15, 1906, was 75 to 100. It is not as central to the mines as Kunze, but good property is being developed near town. Some of the companies in the neighborhood are: Red Boy Copper Mining Company, Saratoga Copper Mining Company, Greenwater Copper Mining Company, United Greenwater Copper Mining Company, Greenwater Consolidated Mining Company.

Lots on the main street are worth around $500; others from $50 up. There are 2200 lots in town; 32 claims cover the townsite. Ramsey has a bank, the Greenwater Banking Corporation, which is said to have done a $20,000 business in one week. Two stories, two rooming houses, two eating houses, a corral, a few saloons, besides residences, and the district recorder's office, are in town; four surveyors, an assayer, and a notary public do business there. The town is already laid out in streets.

The Red Boy and Greenwater Consolidated properties have copper glance on the surface. Red Boy is 1½ miles south of Townsite, and has a good showing in a shaft 40 ft. deep. Greenwater Consolidated also has a fine surface showing, but not much work is done. Copper staining extends over a zone about 1000 ft. wide, associated with large barytes ledges, one of which is 40 ft. wide, and has copper staining through it. The ledge strikes east and west, and dips to the north.

Ramsey is at 4700 ft. altitude. The divide separating Death Valley and Furnace creek valley, above town, is 5400 ft. Southeast from here to Resting Springs district boundary is 10 miles. The country is practically all staked out from two miles over the summit on the Death Valley side to the Amargosa range on the north side of Furnace Creek valley—4 to 5 miles. The Schwab company is boring for water in the Furnace Creek valley below the townsite. From where the well is being bored ground is all claimed north to the foot of the range. Considerable property on the Death Valley side has recently changed hands. The Gladstone group of four claims, almost due south of the Furnace Creek Copper Company's ground, on the steep Death Valley slope, is said to have been sold for a large cash consideration. Fig. 8 shows a copper discovery in the foothill southeast of Rhodes' Well. In the foreground is granite; in the background is Calico peak, composed largely of rhyolite and andesite flows, with sharp color contrast.

Four surveying parties are in the field: the Clark party, for the Tonopah & Los Vegas Railroad; the Borax Smith party, for the Tonopah & Tidewater Railroad, and the surveyors for the telephone and telegraph lines.

It is extremely probable that the next year will see many of the present difficulties removed.

A fine view of Death Valley is obtained from one of the andesite peaks northwest of United States mineral monument, No. 113, at an altitude of 5800 ft. The valley lies far below, in places below sea-level, with white alkali along its borders and apparently small thread-like rivers through its center and on the sides. Panamint mountains, 12,000 ft. high, lie in the background. Rhyolite and andesite flows and entire mountains of rhyolite in red, white and gray colors, beautiful and impressive beyond description, are close at hand. The main part of the valley is swampy alkali, 12 to 15 miles across, and 20 miles or more to the Panamint range. From the summit, on the Death Valley side, a large dike or ledge is seen cutting across the country striking northeast and dipping to the east, and the outcrop can be seen for miles. Parallel to this are three smaller ledges, apparently crossing the ridge in the neighborhood of Patsy Clark's property. The ridge and peaks here are all andesite, with the exception of a granite peak to the east.

John Gillie, superintendent of all mines of the Amalgamated Company, in Butte, Montana, estimates that each foot of shaft in that district cost not less than $100, average; for while many cost less, many cost more, nearly all sinking below the 1000 averaging $150 per foot. Taking it for granted that the total length of these shafts combined is 108,900 ft., the cost of this part of mining in Butte foots up $10,890,000. There are about 150 shafts in Butte, in 30 of which sinking is in progress. The deputy inspector of mines estimates that the underground openings from the shafts aggregate 800 miles.

The Mt. Bischoff Tin Mine, Tasmania

The general manager, H. W. F. Kayser, on Oct. 8, reported as follows: "After having thoroughly examined the different workings, in accordance with instructions from the directors, I have come to the conclusion that it will be unwise, in fact almost impossible, to continue a high fixed output in future. Speaking generally, the greater part of the crushing material is low in grade, and the higher grade ores still in sight have to be handled very judiciously to maintain anything like a regular output, and to extend the life of the mine. The No. 3 bench giving out so suddenly was unexpected, and the only explanation I can make is that the last slip from the higher part of the face forced all the good material out both east and west, leaving only the poor dirt behind. This, with the loss of the brown face, quickly affected the output, and, although there is still some good ore on the No. 3 bench in the solid face going west, and in all probability underfoot also at the north alluvial, and some nice patches here and there in other portions of the workings, I do not think it will be advisable to attempt to maintain, at least for the present, a higher output than about 60 tons per month. This may be increased if the underground works improve. So far, however, the deep ground has been disappointing.

"The pyritic ore on hand, and such surface deposits as are known to exist, may help matters to a certain extent as soon as we are ready to treat this material. With this in view, the erection of a 10-head battery will be started immediately at the old Happy Valley site, but unless new pyritic supplies are discovered the plant will not be kept constantly at work. The pyritic deposit met with in the rise from the main tunnel to the brown face may prove a valuable factor in this respect, and prospecting works are now under way to prove the extent of this formation. The porphyry dikes supply a large portion of the crush dirt, but they are mostly low in grade, and we have to depend on better material to maintain the output; and, as the porphyry is considerably intermixed with pyrites of no value, which has to be picked out, the working expenses have increased by not being able to carry on blasting and stone-breaking work in a wholesale way. This is not the first time anxiety has been felt for the future, but matters have always righted themselves, and, although the mine is not young, there is still hope of improvement."

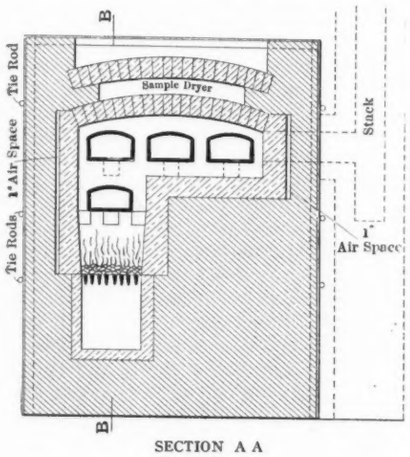
Some changes in the silver markets may be expected in 1907 from the currency changes in Mexico. The general prospect is that the price of the metal will not fall much below its present level, at any rate during the first half of the year.

A Multiple-Muffle Assay Furnace *

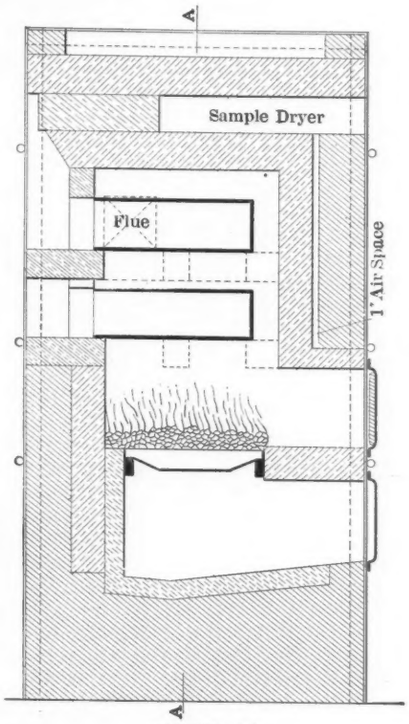
BY H. C. PARMELEE

The conventional styles for assay furnaces make use of from one to three muffles, and the latter has usually been considered a furnace of as large capacity as was expedient to build in single units. In the assay offices of smelting plants or other large reduction works, it has been the custom to duplicate the three- or two-muffle furnaces in order to secure the necessary capacity.

Probably no assayer has failed to be struck with the extravagant waste of heat in the ordinary assay furnace and has realized that the fuel burned was capable of doing much more work than the style of furnace would permit. This has been indicated by red-hot stacks, and by the appearance of carbon in the unburned gases around the muffles; for not only has the fuel burned been capable of heating more muffles, but by reason of the construction of the furnace, the muffles already in it do



SECTION A A



SECTION B B

not receive the full effect of the combustion of the gases.

With a view of accomplishing several things not yet accomplished in assay-furnace construction, J. I. Brown has devised a style of furnace which is worthy of the attention of the members of this association. It has five points of superiority which commend it to assayers having a stress of business.

First, it has larger capacity than the ordinary furnace, being capable of being built for either four or five muffles. This enables the operator to conduct several different operations in the furnace at the same time, thus greatly hastening the completion of the day's work. Fusion, scorification and cupellation can be carried on at the same time, and by constantly advancing the assay through the necessary stages, it is possible to run through a large number of samples. Fusions are made in the lower and upper muffles directly over the fire box; scorifications in the next right-hand muffle and cupellations in the last. The theoretical capacity of this four-muffle furnace is 90 assays per hour. Practically, Mr. Brown has repeatedly handled 400 assays per day of 10 hours, and states that the furnace could easily be made to turn out between 500 and 600 assays per day of 10 hours.

Second, it has a sufficiently large combustion chamber to permit of almost complete combustion of the gases before they escape into the flue. This means that the full effect of the heat is received, with the result stated in the preceding paragraph. Five tons of coal per month are required to operate this furnace to its full capacity, running ten hours per day.

Third, it is provided with a sample dryer which is a valuable adjunct when large numbers of mine samples are to be assayed. This sample dryer makes use of the heat above the muffles, and has greater capacity than a hot plate or similar contrivance, at the same time being absolutely inexpensive.

Fourth, the fire-clay linings are conveniently replaced when burned out. The front of the furnace surrounding the muffles is made of the ordinary molded blocks found on the market especially for this purpose. These can be removed and the inside of the furnace is then open for the purpose of replacing the burned-out interior layer of fire-brick. It will be noticed in this connection that between the pressed-brick body of the furnace and the fire-brick interior there is a 1-inch air space. This permits of the successive expansion and contraction of the fire-brick without placing the stress on the outside walls and tie-rods.

Fifth, it is a forced-draft furnace, the blast being supplied by an electrically operated blower. To prevent the burning out of the grate bars which would ensue under the great heat generated, the ash-pit is provided with a cement water pit which is kept full with water up to the level of the ash-pit door.

The materials used in the construction of the furnace are those commonly used everywhere. The outside walls are of red pressed brick. The inner linings are of fire-brick, and the lining of the ash-pit is of cement. A study of the drawings will supply any ideas that have not been expressed in these notes.

*An article in *Western Chemist and Metallurgist*, November, 1906, compiled from notes and drawings furnished by J. I. Brown, Cripple Creek, Colorado, in whose assay office the furnace is installed, and by whom the furnace was designed.

Negro Mortality in the Transvaal

BY T. LANE CARTER

In the heat of politics some wild statements are made. At a meeting of one of the innumerable factions into which the British element of the Transvaal seems to have divided itself, the leader, Mr. Solomon, made some wild statements regarding unskilled labor on the Rand. He maintained that the high mortality among the natives imported from Central Africa was due to the neglect of these natives by the mining companies. Three of the leading physicians of the Rand have come forward, not as politicians, but as experts, to disprove what Mr. Solomon maintains. There has been a great improvement in the treatment of Kafirs since the war, so that today no one can find fault with the treatment as a whole. The doctors give a most interesting table, showing the death rate of natives from different parts of South Africa, resident on the mines of the Rand. The appalling death rate of the Central African natives shows the absurdity of solving the labor question by drawing from that part of the country. The figures are as follows:

	Mortality per 1000
From temperate areas:	
Orange River Colony	13.9
Natal and Zululand	14.9
Cape Colony	19.8
From sub-tropical areas:	
Southern Portuguese East Coast districts (south of lat. 22 degrees)	35.8
Transvaal	36.0
From tropical areas:	
Northern Portugal East Coast districts—Mozambique	65.8
Quilimane	75.6
Rhodesia	79.8
Damorland	113.8
British Central Africa	166.3

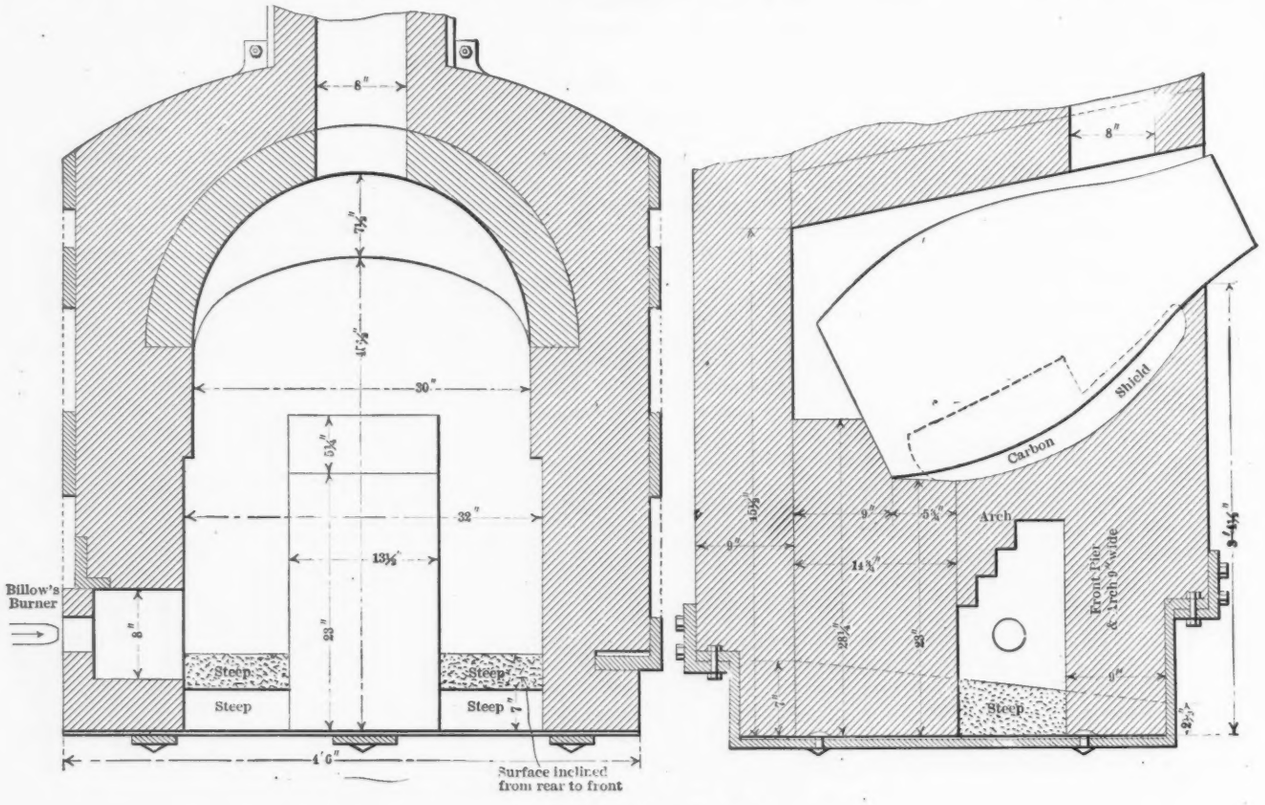
The tropical areas are highly malarial. The general death rate from disease of all natives employed on the Rand mines was 40.3 per 1000 last year. That of the tropical natives averaged 99.3 per 1000; the others, sub-tropical and temperature combined, come out at 33.3. Yet the tropical natives number only 10 per cent. of the total supply. People are beginning to see the folly of re-patriating the Chinese before a substitute is found.

The Faber du Faur Zinc Furnace

What is the construction of the Faber du Faur furnace as used in the United States for distilling silver-zinc crusts from lead desilverization? Especially how is it arranged for heating by the combustion of crude petroleum, which I understand is the general practice?

A. B. C.

The Faber du Faur furnace is a firebrick box of cubical form, built into a cast-iron frame-work which swings on trunnions. The furnace is closed at the top by an arched roof, through which the products of combustion pass off to a flue. The construction of the furnace, as used at the Perth Amboy plant of the American Smelting and Refining Company, is shown in the accompanying engravings. In connection with this furnace the Billow burner, furnished by the National Supply Company, of Chicago, is used. This also is shown in the accompanying engravings. It has been found that this burner gives excellent service, with low oil consumption. The carbon shield, shown in the drawing of the furnace, is simply a part of an old retort, used to protect the bottom of the retort in the furnace from the intense oxidizing heat of the oil.



FABER DU FAUR FURNACE

A discovery of quicksilver ore, running from 1.5 to 7 per cent. mercury, is said to have been made on the west coast of Vancouver Island.

Oil in Alberta, Canada

SPECIAL CORRESPONDENCE

Eugene Coste, of Toronto, who has been actively engaged during the summer in connection with the exploitation of the oil resources of the Canadian Northwest, states that so far no oil in any quantity has been developed, for the reason that drilling operations have not been conducted on a sufficiently extensive scale to thoroughly test the country. When this has been done it will possibly be found that two kinds of oil are obtainable —fuel oil to be used directly for engines and heating purposes, and the more valuable product for refining. Near Pincher creek, south of the North Kootenay pass, a well 1585 ft. in depth has been drilled by the Alberta Oil Company, of Vancouver and Seattle, which has struck a little oil and some gas. The company intends to sink deeper and has ordered a new cable for this purpose. At Dunmore Junction the Canadian Pacific Railway has a well for which Mr. Coste is acting as engineer. The well has been put down 800 ft., obtaining a show of gas, and will be sunk 2000 ft. more, if necessary. A complete outfit worked by five men is on the ground. The company proposes to use the oil, if obtained in sufficient quantities, as fuel for its engines. There is a gas well alongside the railroad shops at Medicine Hat; the gas is used for lighting the station and the municipality has two wells from which gas is supplied to the town. Mr. Coste is also superintending operations at the Canadian Northern Railway Company's well, near Langham, on the North Saskatchewan river, which has now reached a depth of 1000 ft. It is expected that oil will be struck at about 1700 ft. The Rocky Mountain Development Company and the Western Oil and Coal Consolidated Company are also working in southern Alberta, but have not as yet reached oil in commercial quantities.

Old Colony Copper Company

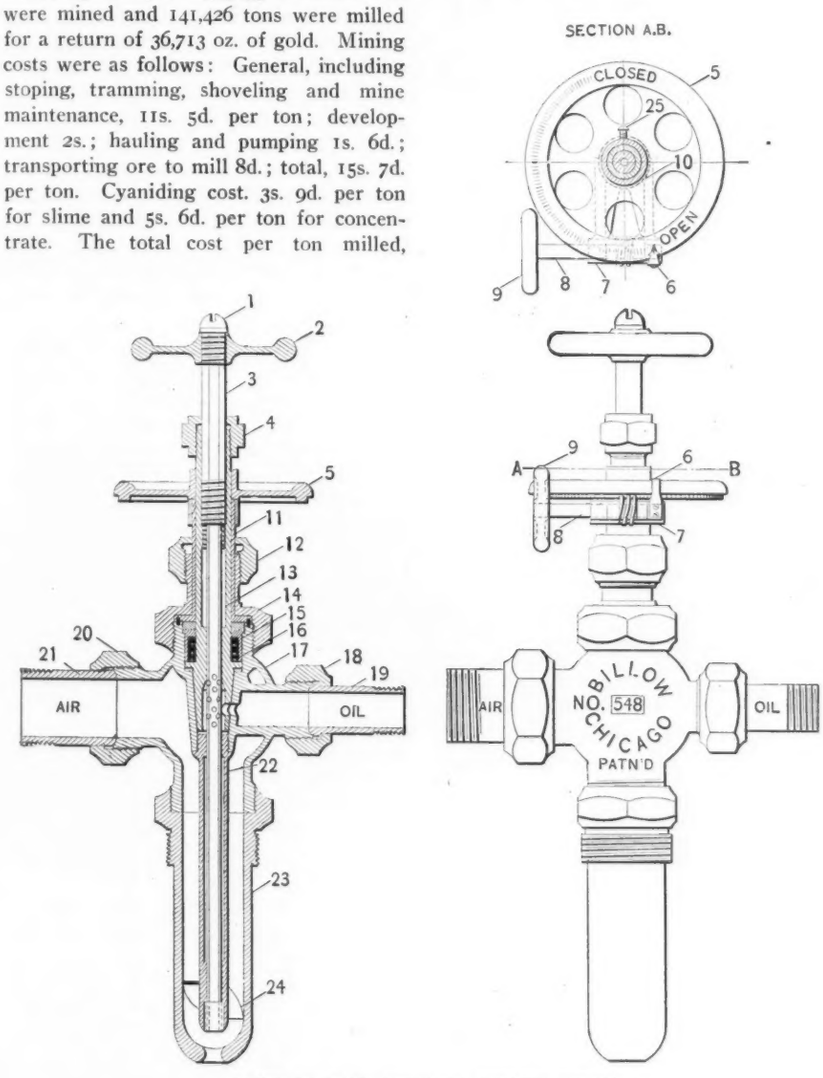
According to the official report of this company for the year ending Nov. 30, 1906, the total development work of the year consisted of 44 ft. of shaft sunk, 140 ft. of crosscuts, and 514.5 ft. of drifts. Copper has not as yet been struck in paying quantities, but indications in one level were good enough to warrant stoping there. Mineral was found in pieces varying from a few ounces up to 15 lb. The appearance of the lode is promising enough to make it expedient to sink to 1000 ft. in order to prospect the formation at that depth.

The treasurer's report shows receipts and equipment to the value of $33,181.55 for the past fiscal year, and expenditures of $22,843.44 for the same period, leaving a balance of $16,845.48. There was due on Oct. 1, 1906, on account of unpaid assessment, $13,853.

The Jumpers Gold Mining Company

The report of this Transvaal company reviews the operations for the fiscal year ended July 31, 1906. The shortage of native labor prevented the uninterrupted running of the full number of stamps, and the unsafe condition of the mine workings greatly restricted the use of rock-drills, and consequently necessitated the employment of a large proportion of the Kafirs in hand drilling.

During the year 174,133 tons of ore were mined and 141,426 tons were milled for a return of 36,713 oz. of gold. Mining costs were as follows: General, including stoping, tramming, shoveling and mine maintenance, 11s. 5d. per ton; development 2s.; hauling and pumping 1s. 6d.; transporting ore to mill 8d.; total, 15s. 7d. per ton. Cyaniding cost. 3s. 9d. per ton for slime and 5s. 6d. per ton for concentrate. The total cost per ton milled, which in the previous year was 24s. 7.5d. was reduced to 23s. 9.6d. during the year reviewed. The average extraction was 79.15 per cent.



FABER DU FAUR FURNACE—BILLOW BURNER

The ore reserves are estimated at 150,385 tons of payable ore, and including ore in the pillars ,the amount of developed ore may be placed at 220,000 tons. Allowing for waste sorted out on the surface, that tonnage will keep the mill running 18 months. During the year, extensive prospecting was carried out on a banket reef which lies to the southward of the south reef. At the surface its distance from the south reef is about 100 ft. It shows medium gold values near the surface.

A large amount of prospecting and sampling was also done in various localities by mining companies with the view of locating. if possisble, the pyritic band formation known to exist underlying the banket in several of the Rand mines. This resulted in locating the band in the company's mine, but the only points where promising values were obtained are in the first level crosscut north at No. 1 shaft, and in a vertical ore chute above that crosscut. The band is about 3 ft. wide and assays 14 dwt. gold per ton. In the crosscut from the level immediately below, the band was cut, but did not assay well.

The mine is expected to be completely worked out within two years, and the company will then depend upon its holdings in their Jumpers Deep Mining Company, and the new slime plant. The plant was recently erected and has a capacity of 6000 tons per month. When in full operation the directors anticipate it will return a net profit of £2000 monthly. It will require five or six years to exhaust the accumulated slime dumps, and it is possible that the re-treatment of accumulated tailings, of which a huge quantity is stored, may result in large annual profits.

The net profit on the operations during the period reviewed was £65,732, which with the balance brought forward from the previous year, made a total surplus of £70,729. This sum was dealt with as follows: Two dividends of 20 per cent. and 30 per cent., respectively, absorbed £50,000; depreciation of plant, £10,682; directors' and auditors' fees, £2000; and balance carried forward £7959. The capital expenditure during the year was £17,144 of which £10,000 was spent in the construction of the new slime plant.

Metal Production in Montana

The report of B. H. Tatem, who is in charge of the Government assay office in Helena, Mont., to the treasury department, in Washington, shows that during 1905 the output of copper in Montana aggregated 308,949,818 lb., of which all except 460,298 lb. was produced in Butte. The figures show that the average month's production in the entire State was 25,745,818 lb., and that of Butte 25,707,460 lb. The total gold produced in the State was 236,517 oz., valued at $4,889,234; silver, 13,454,651 oz. Fergus county was the largest gold producer, its total being 60,869 oz., valued at $1,258,279, and Butte was second with 58,017 oz., valued at $1,199,316. The figures show also that from 1862 to the end of 1905 Montana yielded $296,117,370 in gold, $421,799,490 in silver, $498,493,035 in copper, and $13,878,235 in lead, a total of $1,230,288,130 in value.

Coal in Utah

BY L. H. BEASON

The annual report of Gomer Thomas, State coal-mine inspector, has been issued and covers the operations of the carboniferous mines of Utah during the fiscal year ending Nov. 30. During the period there were produced 1,839,219 short tons, an increase over the preceding year of 236,691 tons. The production of coke was 282,915 short tons, an increase over the preceding year of 66,483 short tons. There was also produced 11,531 short tons of gilsonite, valued at $403,585.

The number of men employed in and around coal mines was 1895, and the average number of days worked was 295. A total of 176,414 lb. of black powder and 95,015 lb. of dynamite were used. The average amount of coal produced per man in and around coal mines was 1107 short tons, and the number of fatal accidents per thousand men was two. There were 28 accidents in Utah coal mines during 1906, of which seven were fatal. Three out of this number were employed in coal mines and four in hydro-carbon mines.

The London Mining Market

BY EDWARD WALKER

The chief feature of the London mining market during the past year has been the importance attached to the metals copper, tin, and zinc. As regards gold mining the tendency in new promotions has been to try Siberian propositions.

The new departure recorded last year in connection with the zinc tailings at Broken Hill has been persevered with. The Sulphide Corporation has built zinc smelters in the north of England for the purpose of treating the concentrates, and the Zinc Corporation is contemplating a similar policy and smelting in South Wales. The latter company has adopted the Potter flotation process and has made contracts to ship some of the concentrates to Germany until the smelters are ready. The company has also been converted from an Australian into an English one, and arrangements have been made to issue new shares to provide additional working capital. Of other zinc propositions the San Francisco del Oro, in Mexico, is of special interest, as there is some hopes that the complex ore may yet prove amenable to treatment. The zinc deposits in Rhodesia are being actively exploited, in spite of the rather pessimistic report of R. J. Frecheville, and, as the railway has now reached the mine, operations will be considerably expedited. Among lead-mining companies, an interesting flotation was that of the celebrated silver-lead mines in Burma, under the name of the Burma Mines, Railway and Smelting Company. It is suitable to mention here, also, that the Australian Smelting Corporation reorganized here last year has now settled down to a definite policy, and is removing its works from Dapto to Port Kembla.

The continued demand for tin has led to extensive developments among the old and disused mines in Cornwall and considerable sums of money have been subscribed for this purpose in London. Many mines that shut down owing to the low price of tin or because of the other metals present have been reopened, and before long the output should increase notably. The pioneer of the new order of things, the Clitters United, is now in full working order. The increase in the price of the metal has brought large profits to Dolcoath, and at Carnbrea and Tincroft it has turned a chronic debit balance into a profit. Other large producers, working on the old cost-book system, such as the Levant and the Grenville, have made increased profits. The most interesting reopening has been that of the Botallack. Among foreign tin-mining companies owned in London, the Briseis, Tronoh, and Kinta have done well, though for some reason or other the bears made an onslaught on the first named.

In the copper section a number of new properties have been introduced, such as the Mitterberg, in the Tyrol; the Choicas, in Argentine; the Toldal, and the Lake, in Norway; the Bruce Mines in Ontario, and the Great Cobar in New South Wales. Of these the last named was the most notable flotation, owing to the very large sum of money paid as purchase price, and owing also to the extent of the known ore. Of the others, the Choicas, owned by the Mining Exploration Company, promises to become a most important producer in the near future. The Rio Tinto Company continues to hold the premier position among copper producers controlled in London. The ordinary shares of £5 par value stand at the time of writing at £80, which is a high price, even considering that an interim dividend at the rate of 100 per cent. per annum has just been declared. The Mountain Copper Company, of Shasta county, Cal., and San Francisco, controlled by the same group as Rio Tinto, has spent large sums during the year in extending operations, and has in consequence postponed the further redemption of the debentures arranged for under the scheme of 1902, but this application of profits to extending the operations of the company will put the company in a very strong position. The Spassky mine in Siberia, where such rich deposits have been opened up, is proceeding slowly, owing chiefly to political and racial reasons, and a company has had to be formed locally to be the immediate owner of the property in order to comply with Russian requirements. The Caucasus Copper Company, which met with so great difficulties in concentrating, has got the magnetic separators in place, and the hopefulness as to the result may be gaged by the fact that the quotation of the shares has gone up. The Etruscan Copper Estates, so long the laughing stock of the mining profession, has fallen from favor even among its own directors, and prospecting is now going on in a hopeless sort of way. The Capillitas, in the Argentine, of which so much was expected, is opening up indifferently, and it has become necessary to undertake systematic prospecting instead of relying on the traditions of ore left by former owners. The Tyee Copper Company, on Vancouver island, has continued to be disappointing, the main body approaching depletion, and no new bodies being discovered by the developments. The collapse of the Fresno Copper Company, of California, is fresh in your readers' memories. The shares of several American copper companies have been placed in London this year. The only ones of any reliability are those of the Butte Coalition, introduced by the Exploration Company. Among the others the most important are the Penn-Wyoming, but, considering the history of the company, the value of the shares is a doubtful quantity.

In the South African market there has been an entire absence of life. The future of the mines is too well known to afford any chance for speculating. As the months and years go on, the extraction of the gold gradually decreases the capital value of the shares in a very well defined manner. The efforts of the controllers of the market are now chiefly directed to economies in working. In many cases there have been amalgamations with a view to economy, and much more extensive amalgamations are discussed. The new schemes for supplying electrical energy wholesale, one from Vereeniging, and one from the Victoria falls, are nearing completion, and will have an important effect eventually on economies and merging of interests. The labor problem still causes trouble and the Chinaman is the center of political storms. The future is still unsettled, for no one knows what the approaching Transvaal constitution will bring forth.

There has been no noteworthy incident in connection with West Australian mining. Ivanhoe, Great Boulder, Golden Horseshoe and others continue to be large producers. Lake View Consols has nearly dropped out, and is now utilizing its funds for investment in other schemes. Perseverance is now a low-grade proposition. Great Fingall has been obliged to reduce its output during developments, owing to the gradual drop in the value of the ore.

In the Indian group of mines, the most important event has been the falling off in the grade at Champion Reef. Egyptian mining continues within narrow limits.

Among American gold mines owned here, Camp Bird has recovered from the disastrous snowslide of last spring and should again be making profits before long. El Oro has resumed dividends after spending so large an amount of money on extending the mill. Its subsidiary company, the Mexico Mines of El Oro, will shortly be in working order. The Tomboy Company is making good profits out of the Argentine claim. Le Roi Company, under Mr. McMillan's control, has made a profit, and Le Roi No. 2 continues to pay dividends.

Incidents in connection with British mining which deserve mention are the falling of the St. Davids gold mine in Wales into barren rock, and the capture of some of the most valuable coalfields in South Wales by German and French syndicates.

Mexico's Railroad Commission

The *Mexican Investor* says that government regulation of freight rates in Mexico is virtually complete. It is done through a commission, consisting of a president and six members. No freight rate can go into effect unless it be approved by the commission, and a rate once in effect can be changed only by convincing the commission of the advisability from the standpoints of shippers, the public and the government, as well as of the railroad.

THE RESOURCES AND STRATEGIC POSITION OF THE COLORADO FUEL AND IRON COMPANY

The Water Supply—Coal and Iron Mines—Production and Earnings

BY LAWRENCE LEWIS *

A perfectly reliable water supply is as essential to the operations of an iron and steel plant as are coke and ore. The problem is all the more serious in a semi-arid region, where the demand for water for irrigation is far in excess of the supply. The Colorado Fuel and Iron Company has therefore taken the precaution to fortify itself against a failure of water, and has spent an immense amount of money for reservoirs, ditches and water rights.

When the iron and steel industry at Pueblo was first inaugurated in 1881, dependence was placed in an artificial lake of 450,000,000 gal. capacity, covering 185 acres (now designated by the company as reservoir No. 1, or Lake Minnequa), located about a mile from the plant. This lake is supplied by an open ditch about twelve miles long, drawing water from the St. Charles river, a tributary of the Arkansas river. The company subsequently bought water rights, that is, purchased the right to take a specific number of "second feet" from the Arkansas river, but failing to appreciate that the industry would ultimately grow to great proportions, these rights, unfortunately, were subsequently sacrificed. As the iron and steel works developed at Pueblo it became necessary to procure a larger water supply, and for this purpose two storage reservoirs were constructed upon the plains four miles from the works. One of these, of 500,000,000 gal. capacity, designated as reservoir No. 2, or Lake Savard, covers 190 acres. The other, of 1,000,000,000 gal. capacity, designated as reservoir No. 3, covers 298 acres. These last two were connected by another and larger ditch, six miles in length, and a natural water course five miles long, to convey storm water from the St. Charles river.

These two new reservoirs, however, are solely dependent upon storm water, with the exception that No. 2 receives a limited amount of water from the original St. Charles ditch. This dependence was too uncertain for an industry of the present magnitude of the Minnequa works, producing several thousand tons of manufactures daily. Accordingly a more comprehensive scheme was determined upon.

INCREASING THE SUPPLY

After various sources of possible supply had been examined, different routes surveyed and general estimates prepared, the entire subject was taken up by a commission headed by the president of the company and by John Birkinbine, of Philadelphia, consulting engineer for the company. This commission united in a report approving the plan under which an increased water supply is being provided. The prospective demands of the Minnequa works, at Pueblo, were fixed by the commission at 50,000,000 gal. of water daily, and accordingly the water-supply system has been planned to supply this quantity. Some idea of how great an amount 50,000,000 gal. of water a day is can be gained from the fact that Denver, with a population of about 160,000 people, uses only 30,000,000 to 40,000,000 gal. a day during midsummer, when lawns and trees are being irrigated, streets sprinkled, etc. Each of the large blast furnaces at the Minnequa works uses about as much water as a city of 40,000 people.

The scheme decided upon to supply the Minnequa works included the utilization of a storage reservoir constructed by the Colorado Fuel and Iron Company close to the snow-covered mountains, near the head waters of the Arkansas river, to supplement water rights on the Arkansas river, purchased to supply the works with the quantity required. This storage basin is known as Sugar Loaf reservoir, and occupies the bed of an ancient lake, near Hagerman pass, six miles from Leadville, upon which the water is raised some 30 ft. by an embankment, giving a capacity of 5,674,000,000 gal., the water surface of 815 acres being over 10,000 ft. above sea level.

WATER RIGHTS

The allotments for water rights for irrigation purposes along the Arkansas river and its tributaries, as on other Colorado streams, greatly exceed the normal flow, and this reservoir is available only to catch the excess water, mainly that which results from the rapidly melting snows on the nearby mountains in the spring months. The plan is to discharge this accumulated water, when needed, to the bed of the Arkansas river, allow it to flow down this bed for 130 miles, to a point where it is diverted by a low dam into a conduit some 37 miles in length, which will convey the water (less the percentage of loss, by evaporation and other causes, estimated by the State engineer and averaging about 10 per cent.) into the plains reservoirs, Nos. 1, 2 and 3, above mentioned. The water rights when purchased were in use to irrigate lands 30 miles east of Pueblo, and it was necessary to remove these rights, by tedious legal proceedings, to a point where it was intended to divert the water, about 30 miles west of Pueblo. It is not probable that the changing of the point of diversion of the water rights, now owned by the Colorado Fuel and Iron Company, to a place 60 miles up stream from the original point, will be a disadvantage to those

LAKE MINNEQUA OR RESERVOIR NO. 1

*The writer of this article is indebted for the facts concerning the water supply of the Minnequa works to the report made under date of July 6, 1906, to the president of the company by John Birkinbine, of Philadelphia, consulting engineer for the Colorado Fuel and Iron Company.

Note—In the article on the Colorado Fuel and Iron Company in the JOURNAL for Dec. 29, 1906, the illustration which read "General Offices and Hospital" should have been entitled "General Offices at the Pueblo Plant"; the illustration entitled 40-in. Blooming Mill" should have read "Soaking Pits at 40-in. Blooming Mill."—[Ed.]

who have allotments from the Arkansas river below Pueblo, for the bulk of water will not be consumed, but will pass through the works, being applied en route to cooling, condensing, steam generation, and to hydraulic machinery. That the water lost by evaporation will be much less than the proportion which would be actually taken up by vegetation, if used for irrigation, is demonstrated by systematic gagings of the overflow in the Minnequa works sewer system, careful records of which have been maintained.

This so called "Arkansas Valley conduit" has been under actual construction since early in November, 1905, and will be completed by Jan. 1, 1907. Surveys were first made about two years ago. The water is to be taken from the Arkansas river, below Florence, at the level of 5088 feet above tide. After passing through four skimming pools, 60x100 ft., it is carried through and around hills, across arroyos and plains, 37 miles to a series of settling basins, after which it empties into reservoir No. 3. There are 27 pipe siphons, with a total length of 43,000 ft. (one a mile long under the town of Portland). All of the crossings over arroyos and the siphons are made of wooden stave pipe, 48 to 60 in. in diameter, and vary in length from 100 to 5200 ft., the head on the pipe in some cases reaching 150 ft. In several cases the pipe is supported on bridges or by walls, and some of the siphons have intermediate summits, which are provided with air vents. Part of the conduit along the face of the bluffs (about four miles in all) is open ditch, protected by means of concrete lining; there are also five tunnels, one of which is 1100 ft. in length, and there are also a number of deep rock cuts.

Naturally the most difficult work is where the conduit line is in the river bottom lands, or passes along the shale or limestone bluffs, forming the boundary of the mesa or plains section, and defining the original shore of the Arkansas river. Deep rock cuts, some of them through overhanging ledges, supporting walls filling nearly vertical gashes, or acting as dams for sharp depressions of greater width, are features of construction.

CONSTRUCTION OF PIPE LINES

The creek or arroyo crossings have demanded special care and attention, the nearly vertical sides making the construction of the pipe lines difficult, and requiring that these be anchored. In crossing the stream-bed in these arroyos, piling and crib construction is necessary to protect the pipe, for these beds, while normally bare of water, carry great volumes rushing down in times of freshets, which move sand, gravel and boulders. The mesa country, which lies between the line of conduit and the mountains, from 20 to 30 miles distant, supports only the sparse vegetation incident to an unirrigated section with a scanty rainfall. Consequently there is but little to retard the immediate run-off of water, and so called cloudbursts may, in a short interval, transform a normally dry stream-bed into a torrential stream, discharging at high velocity an enormous volume, heavily charged with solid matter.

The conduit has been proportioned to convey 80 second feet of water, or say 52,000,000 gal. daily. The total length of the conduit, from head-gates to the plains reservoirs, is 196,300 ft., or slightly over 37 miles, and the difference in elevation between the head-gates on the Arkansas river and the full water surface of the higher reservoir is 130 ft., most of which is taken up by frictional allowances.

Water from the conduit can be diverted into either reservoir No. 3 or No. 2, or fed from No. 3 into No. 2 at will, and also to the original reservoir No. 1.

The plains reservoirs Nos. 2 and 3, which are now in use, have water surface 4920 and 4958 ft., respectively, above sea level, and are connected with the Minnequa works by a wooden stave pipe line, 28 in. in diameter. The improvements under contract include the addition of another line of wooden stave pipe, 48 in. in diameter, nearly 4.5 miles long. The Minnequa works, for which this water supply is designed, has a mean elevation of 4770 ft. above tide, or 150 ft. below the lower plains reservoir, and 23,200 ft. distant.

With the Arkansas Valley conduit in successful operation, the Minnequa works will have an ample supply of water under natural head, and the charges for interest on investment, for maintenance and repair, will be much below similar items for furnishing an equal quantity by pumping

WIDELY SCATTERED PROPERTIES

Like the original Carnegie Steel Company, the Colorado Fuel and Iron Company owns or controls sources for all its raw materials, including iron lands in Colorado, Wyoming, New Mexico and Utah; some 600 square miles of excellent coal, anthracite, as well as coking and non-coking bituminous, one tract being 250,000 acres in extent, all easily accessible from the steel plant; limestone and dolomite quarries; manganese mines; etc. It has 39 coal mines and 3500 coke ovens. Most of the coke ovens are of the "bee-hive" and a few of the "stack" type. There are no by-product ovens in use by this company for the reason that there is no market for by-products, other than gas, sufficient to warrant the extra expense entailed in the construction of this class of ovens. They are comparatively costly and provoke considerable prejudice because of the contention of some experts that the quality of coke produced in by-product ovens is inferior. Including those not yet fully opened up, the Colorado Fuel and Iron Company has in various parts of Colorado, Utah, Wyoming and New Mexico, 65 properties scattered over an area of 260,000 square miles, a region as large as that included in Germany, Belgium, Holland, Denmark and Switzerland. Sunrise, Wyoming, and Fierro, New Mexico, respectively the extreme northern and southern properties, are distant from one another 1000 miles by rail. To visit all the forty-odd properties now in active operation would require a journey of 3600 miles, and a vertical ascent from the lowest to the highest of all, about 1.25 miles.

There is under contemplation at present the opening of two, and probably three, additional coal mines in Las Animas county, Colorado, which, when completed, will not only add to the tonnage of coal for commercial purposes, but will enable the coke ovens in that district to be more fully operated. The product thereof will materially increase the supply, both for commercial purposes and for consumption at the Minnequa works.

During the past year expenditures for improvements and betterments at the Minnequa works, coal and iron-ore mines, and limestone quarries have been made upon a generous scale. The physical condition of these properties and their equipment have been carefully maintained so that they are in good condition for future continuous operation.

PRODUCTION

The production, in tons of 2000 lb., for the fiscal years ended June 30, 1904, 1905 and 1906 is shown in the accompanying table.

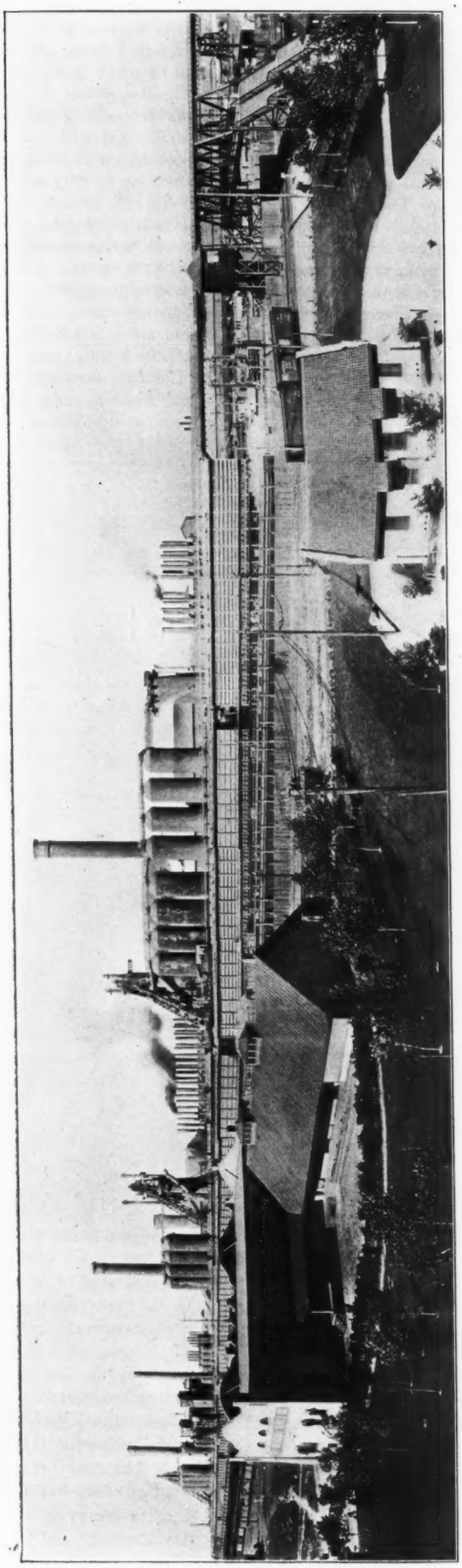
MATERIAL.	1904.	1905.	1906.	INCREASE IN 1906 OVER	
				1904.	1905.
Coal	3,391,547	4,504,752	5,056,377	49%	12%
Coke	508,600	948,553	1,095,133	115%	15%
Iron ore	192,870	483,570	* 803,383	317%	66%
Limestone	108,762	213,077	369,921	240%	74%
Iron and steel	744,333	1,444,177	1,900,168	155%	32%

* Exclusive of 72,992 long tons of iron ore purchased from Lake Superior.

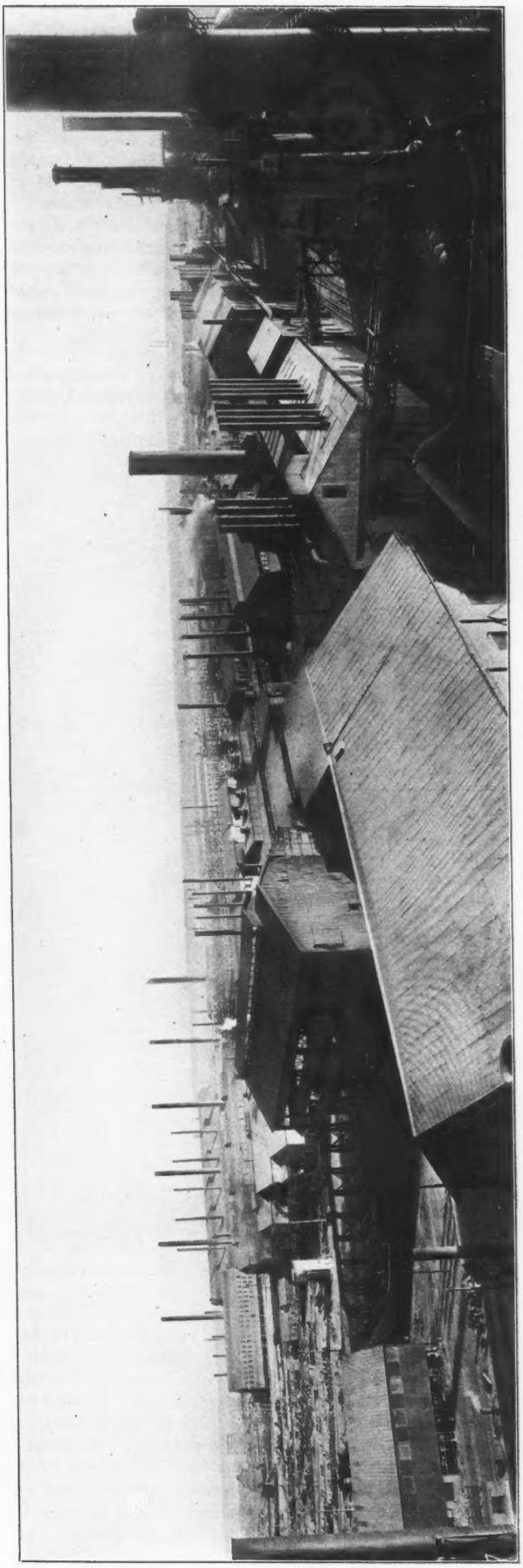
The percentages of increase for the year ended June 30, 1906, over 1905 and 1904, respectively, are shown in the table.

EARNINGS

The gross earnings from operations for the year ended June 30, 1906, were $22,320,046, an increase of $3,705,028, as compared with the preceding year. The gross earnings of the iron department show an increase of $3,283,441, and the industrial (fuel) department an increase of $428,450, and the miscellaneous a decrease



BLAST FURNACE DEPARTMENT



GENERAL VIEW OF WORKS

of $6,862. The net earnings from operations were $2,559,029, showing an increase of $1,084,835. The total net earnings from all sources amounted to $3,064,729, an increase of $1,142,683. After the payment of all fixed charges, interest, taxes, sinking funds, rentals, etc., there is left a surplus of $671,812, carried to the credit of profit and loss, against a deficit for the preceding year of $341,993. By reason of inability to develop the iron-ore properties with sufficient rapidity, the operations of the past year were burdened with an expense of $238,844 for the excess cost of Lake Superior ore purchased, over what it would have cost if it could have been produced from the company's own mines. It is not probable, however, that this contingency will again arise, and the net results from operations for the current year should be correspondingly increased.

Throughout all processes of mining and steel making the company uses the most improved labor-saving machinery. Indeed, from the time the iron ore lies in the earth until it is put into its final form as finished iron or steel it is, in many cases, not handled over once or twice by manual labor, but almost altogether by automatic machinery.

That the Colorado Fuel and Iron Company operates the only large steel plant west of the Chicago district, and that it is one of the comparatively few large fuel and iron companies not a constituent part of the United States Steel Corporation, are important points to be borne in mind in considering this company's place in the iron trade. By owning all the sources of its raw materials it is absolutely independent of competitors. Furthermore, the Colorado Fuel and Iron Company has always been protected to a great extent in its natural market—the far West—by reason of the geographical position of the steel plant at Pueblo, and the long haul for competitors, from at least as far east as Chicago. In the early days of the plant, the Colorado steel products were nevertheless discriminated against in the Pacific coast market by the railroads in favor of Joliet and Pittsburg steel. Several appeals were made in the days of the Osgood-Kebler régime to the Interstate Commerce Commission, with but indifferent results. If the present railway rate bill is found to be a success in preventing such discriminations in the future, it will be of immeasurable benefit to the Pueblo plant. Colorado steel products will then have the virtual monopoly in the great region from a north and south line running through Kansas and Nebraska, west to the Pacific coast and from Canada to Mexico (rapidly growing regions which are absorbing immense quantities of rails and all forms of steel products). Furthermore, when the plant reaches the magnitude which the management has planned, Pueblo-made rails, wire, etc., will enter the Oriental and South American markets by way of Galveston and the Pacific ports. With the completion of the Panama canal Colorado steel products will have two outlets to the Orient—south and west. Even should the present rate bill be a failure, the fact that the steel plant at Pueblo is located on the main transcontinental Gould railroad system—made up of the Wabash, the Missouri Pacific, the Denver & Rio Grande, the Rio Grande Western, and the Western Pacific, now under construction from Salt Lake to San Francisco, is a protection against fatal railway rate discriminations in the future.

STRATEGIC POSITION

The advantage to the company of having its plant located on the main line of a "friendly" railroad was shown in the winter and spring of 1904 during the depression then existing in the iron market. The American Steel and Wire Company secured at that time, according to press despatches, a heavy reduction in rates on one or more railroads to Colorado common points, for its nails and other wire products. This was almost immediately met by an even greater cut made by the Missouri Pacific Railway, to Missouri river common points and farther east on the Wabash, for the benefit of the products of the wire mill at the Minnequa works. Pueblo-made wire began to compete in the markets long conceded to the Joliet product, in retaliation for the invasion of Colorado by Illinois wire. The result was that the old railroad rates were soon restored, and the Colorado Fuel and Iron Company was allowed to enjoy its own natural market.

It is well to consider the unusual natural and economic difficulties with which the successive managements of Colorado's iron and steel industry have had to grapple. The problems of development of the industry in the Rocky mountain region are fundamentally different from those which confronted the iron and fuel corporations in the middle West. When development of the iron and coal resources was begun on a large scale in the latter region, means of transportation were to a great extent already provided, or by the construction of short spurs of railroad and the utilization of the means of cheap transportation offered by natural waterways, raw materials could be transported to the furnaces and thence to the market at comparatively small cost, and without great preliminary expenditure. Water was abundant and free. Moreover, in the comparatively thickly settled middle West the securing of an abundant supply of labor near at hand was possible and, in many cases, towns and dwellings for workmen already existed at or nearby the seats of industry. The pioneers of the iron and fuel industry in the Rocky mountain region found no such ready-made conditions. No navigable lakes or rivers exist in the region in which the Colorado Fuel and Iron Company operates. To reach new properties high up in the hills or far off in the desert, existing railroads had to be induced to make costly extensions or the steel company had to go to the great expense of building its own lines. It now operates 178 miles of railroad, and has supplemented existing lines of electric communication by 1835 miles of private telegraph. In fact, in many cases in addition to the task of opening mines and providing means of transportation, the company has had the burden of building towns, of providing people to live in them, and of supplying water, food and merchandise. Besides the ordinary problems of coal and iron mining, coke and steel making, the Colorado Fuel and Iron Company has had those of general development of many almost uninhabited and wild districts.

American Interests in the Congo

According to the official newspaper of the Congo Free State, the *Bulletin Officiel de L'Etat Independent du Congo, a royal* decree, dated Nov. 9, 1906, transfers to the Ryan syndicate the right to prospect for metals over the whole of the unassigned public domain for six years. Whatever mines may be established by this exploration may be worked for 99 years, one out of every three becoming immediately the property of the State.

A company known as the International Congo Lumber and Mining Company has been organized to finance this concession with a capital of 3500 shares, half of which are taken by the American syndicate and the other half by Belgian capitalists. The American syndicate paid $150,000 down and is pledged to bring the total payment for its half of the concession up to $1,500,000. The grant covers an area of about 2,500,000 acres. Besides its mining rights, the company has obtained a grant of about 741,000 acres of forest land and the right to harvest a rubber-producing plant over an area of 2,470,000 acres. The syndicate has obtained additional rights to 12,000 acres on each bank of navigable streams and a 10-year option on 1,000,000 acres more.

The American directors of the company are Wm. H. Page, attorney for the Continental Rubber Company; A. Chester Beatty, of the Guggenheim staff of mining engineers, and J. G. Whitley, consul-general of the Congo Free State to the United States.

A new copper company has been formed in Brussels to mine deposits in Upper Katanga, a grant of which has been obtained from the Congo State. The capital is 10,000,000 francs, one-half of which has been subscribed by the English company, Tanganyika Concessions, Limited, and the other by the Société Générale de Belgique.

ELECTRICAL PLANT OF THE DAHLBUSCH MINE

The Equipment, Arrangement, and Method of Operation at a German Colliery

BY ALFRED GRADENWITZ*

The Dahlbusch Mining Company (Germany) has been extending its works ever since 1900, and recently decided to utilize the excess gases from the newly installed coke ovens with a view to raise steam.

The electrical central station eventually installed by the Siemens-Schuckert Works, of Berlin, is one of the most important electrical mining plants in the Rhenanian-Westphalian coal district, and as the whole of its features can be taken as typical for similar plants in large mining concerns, a description of the same will not be amiss.

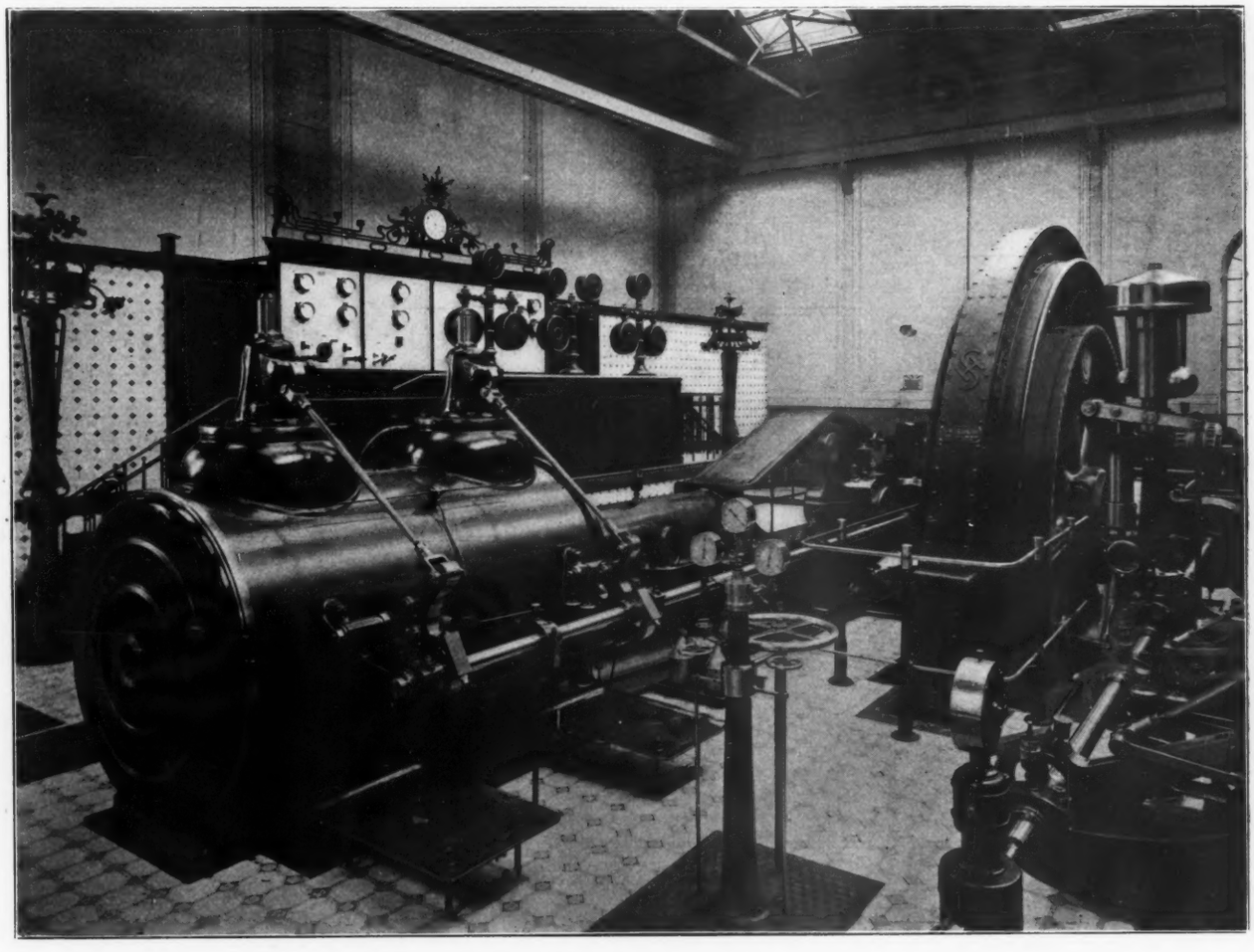
The six hauling pits of the company are arranged in three separated pit plants, namely, pit A, pit B, and pit C, respectively. Between the pits B and C, there is in addition an air shaft.

*Korner Strasse 25, Berlin W. 35.

PLAN OF INSTALLATION

In planning the electrical central station, it was found advisable to install two power stations, one in each of the second and third pits, owing, on one hand, to the relatively great distances, and on the other with a view to better utilize the existing boiler battery. The two central stations, the more important of which is located in the pit A, are connected together by two iron-band armored lead cables, each 3x50 sq.mm. in cross section, to which pit B as well as the air pit are also connected; 400 h.p. can be transmitted by their aid between the two plants with about 3 per cent. loss. Should either of the cables become damaged, the other would be quite sufficient to supply energy to the more important electrical installations. In normal operation, one of the cables is used as lighting cable, and the other as power cable, thus avoiding any oscillations in the lighting circuit as a consequence of those in the power circuit. Should either of the central stations be disabled, these cables would allow energy to be supplied to practically all the current-consuming places, while on the other hand, operation is made economical, for each of the central stations can be used temporarily to operate the whole plant in case of a deficit or surplus of steam in either of them.

The two cables branch off from the switchboard of the power station in pit A, leading through the ground across pit B to the switchboard of the other central station. In the pit B, a branch conductor leads from each cable to the bus bars of the switchboard in the substation there located. The air shaft above referred to, which is also connected to the two cables, is fitted with an electrically operated Capell ventilating fan.



GENERATOR AT DAHLBUSCH MINE

In installing large electrical central stations, the result aimed at should be to produce sufficient energy to operate even the most remote machines, both above and below ground, with a maximum efficiency, this energy being generated under conditions as economical as possible. In connection with mining plants, the possibility of ready extension of the central station should also be warranted. In the pres-

ent case the rotary-current system was found to be most suitable to comply with the above conditions.

STYLE OF EQUIPMENT

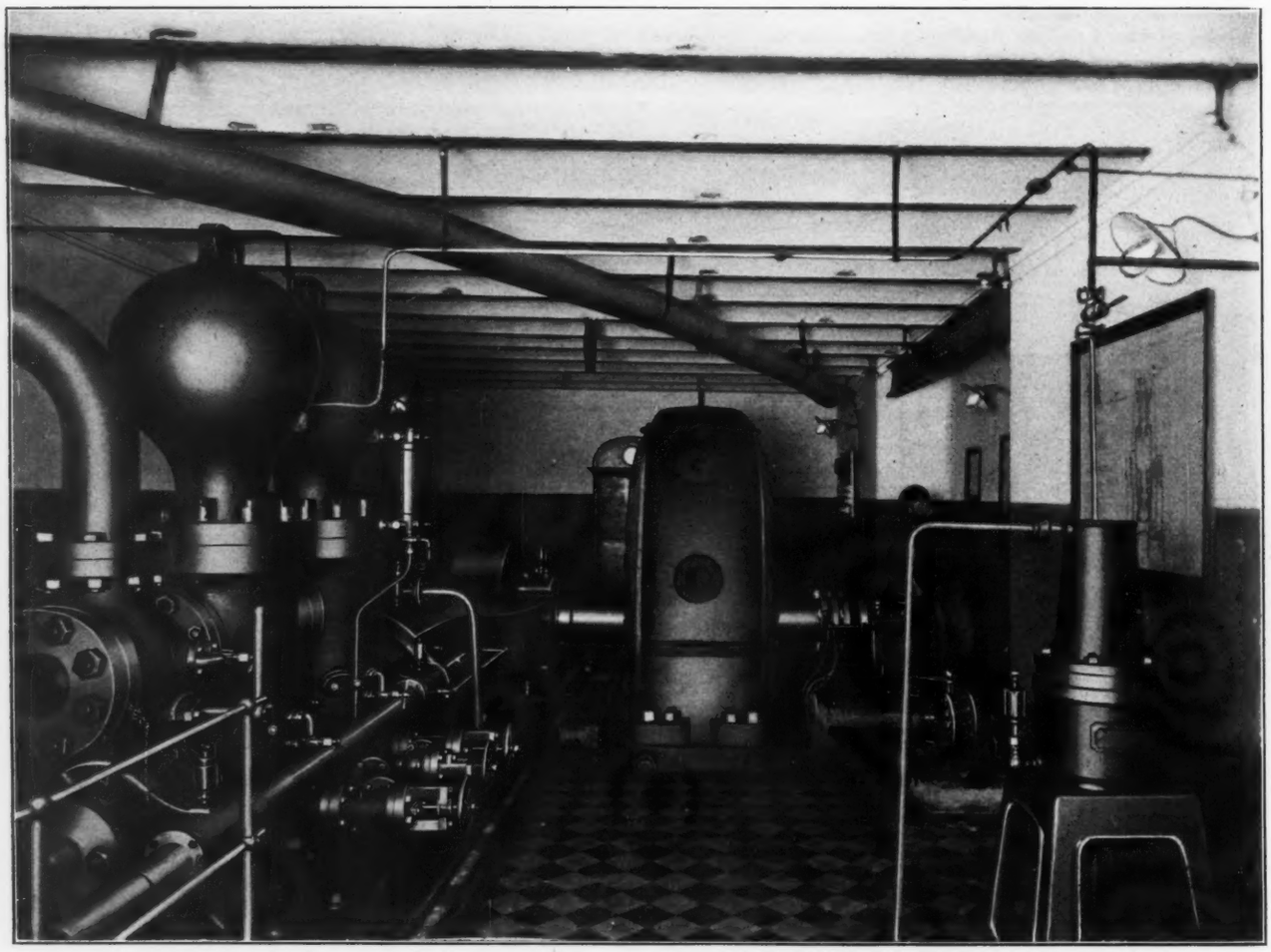
In pit A a 325-kw. steam dynamo, and in pit C a similar unit of 100 kw. capacity have been installed for the beginning. The twin-compound steam engine of the horizontal type driving these was supplied by Kuhn, of Stuttgart-Berg; it works at 100 r.p.m., the admission tension of the steam being 7 atmospheres in connection with a central condensing plant, and yields normally 400 efficient h.p. and a maximum output of 550 efficient h.p. The rotary part of the generator is keyed direct to the shaft of the steam engine, and has been designed heavy enough to contain any fly masses required for parallel operation and for producing a uniform working, thus doing away with the necessity of a special flywheel. The coils are readily accessible from both sides, and the poles of the magnet rim are so screwed to the edge of the rotor that it may be removed sideways, after loosening some screws, without dismounting the stator. The coils in which the rotary current of 2,000 volts working tension is generated are on the inner side of the external stationary part. The terminals from which the current is collected are located at the lower part of the casing and are so arranged as to exclude any risk of an accidental contact.

To generate the direct-current energy required for the permanent excitation of the steam dynamo, a special direct-current rotary-current transformer of 32 kw. direct current capacity at 110 volts has been installed; this suffices for the excitation of 3 sets. The rotary-current motor direct connected to the dynamo is of 40 h.p. capacity at 2000 volts and 730 r.p.m. In order to provide the first excitation required on beginning operation, independently of the rotary-current machine, a small dynamo, driven by a high-speed rotary steam engine has been added.

Another generating set has been installed in the shape of a Brown-Boveri-Parsons turbo-alternator of 900 kw. output.

The high-tension current generated by the rotary-current dynamo is transmitted through iron-band armored lead cables to the high-tension bus bars located in the cellar, high-tension fuses and high-tension tube switches provided on its path.

The switchboard is located on a platform situated about 3 ft. above the floor, and consists of panels containing the levers for the rotary-current generator main switch-outs, and for the long-distance transmission, while the switch-outs themselves are located on the frame in the cellar. A special column containing any necessary measuring instruments has been provided for each machine and another for the parallel switching outfit. The panel containing the switch-outs, fuses and measuring instruments for the exciter dynamo and for the converters as well as the low-tension apparatus for the main power and light circuits, is placed somewhat to the rear on the same platform. Behind this is the lighting switchboard proper. The whole switching plant has been so designed as to be susceptible of an extension of up to 3000 kw. Apart from the turbo-dynamo, supplied by Brown, Boveri & Co., all the electrical machinery has been constructed by the Siemens-Schuckert Works.



PUMP MOTOR IN DAHLBUSCH MINE

The daily work of a grown man has been found by a French physiologist to be about 0.47 h.p. per hour. He calculates that 250 workmen at three francs per day, or a total of 750 francs, would yield 100 h.p., which would be supplied by horses at a cost of 60 francs, and by a gas motor for 3.50 francs. This is interesting if correct.

Coal in Illinois in 1906

BY F. W. PARSONS

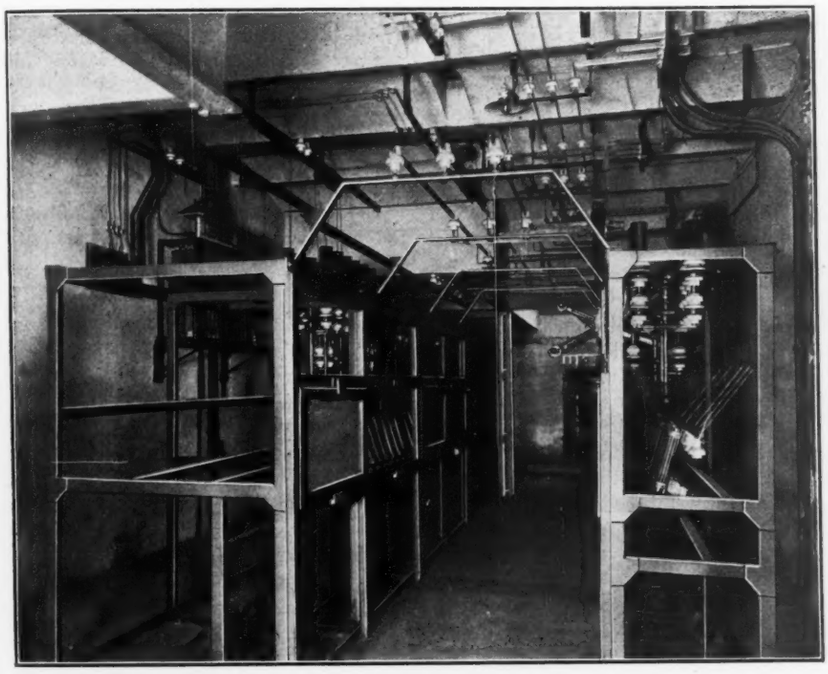
It is probable that 1906 will prove to be the banner year in the history of Illinois coal mining. Great activity has taken place in the development of new fields, and the opening of many new mines. The general tendency has been toward a consolidation of the smaller independent concerns, and the forming of larger, stronger corporations. The entire State may be said to be thoroughly unionized, and as a partial result of this condition, the operators are receiving a more uniform price for their product.

One of the difficulties in coal mining throughout Illinois is the attempt on the part of the operators to observe general laws that cannot be fairly applied to all the mines because of the differing conditions. While this is an advantage to some, it is a serious impediment to others. The O'Gara Coal Company, Dering Coal Company, and the Vandalia Coal Company have all pursued an active policy of expansion and aggressive development. The greatest improvement in operating the mines in this State has come from the efforts of these larger companies to abandon the irregular and unsystematic methods that have heretofore been used, and to follow some general plans that is thought to be suited to the mine in question.

Of all the coal States of any importance, Illinois has probably lost more coal through inefficient methods of mining than any other terrntory. It is a fact that in many districts the local conditions seem to prevent the systematic robbing of pillars; however, it is certainly true that acres of coal that have been lost through squeezes, might have been recovered, had a more systematic plan been adopted.

The year has not shown much advancement so far as coal washeries and methods of treatment are concerned; but in the construction of steel tipples, modern screens, self-dumping cages, and the installation of modern power plants, the State has shown a noteworthy advance.

New railroads are being built, new companies formed, and greater activity than has heretofore been witnessed is taking place. The present outlook is that Illinois will probably show a greater new development during 1907 than any other coal State.



HIGH-TENSION BUS BARS IN DAHLBUSCH MINE

The British Coal Trade

The coal exported from Great Britain up to Nov. 30 amounted to 70,055,072 tons, which shows an increase of nearly 9,000,000 tons over the exports of the same period in 1905. The increase in exports in 1906 will amount to more than 15 per cent., which large increase is principally due to the greater demand for fuel that came from France, Italy and Germany. More than one-third of the coal shipped from Great Britain was destined to one of those countries.

The exports of coal to the United States during the year will show a decline of about 60 per cent. In 1905 the exports to Atlantic and Pacific ports were 131,769, while the estimated exports this year to the United States ports is 38,800 long tons.

The Belgian Coal Trade

The foreign coal trade of Belgium for the 10 months ending Oct. 31 was very satisfactory. The imports and exports of coal were nearly equal, and both showed a substantial increase. The imports amounted to 4,430,454 tons, showing an increase of 1,055,484 tons during the 10 months; the exports were 220,000 tons less than the imports, and showed an increase of 305,135 tons. If, however, the exports of coke and briquets are included with the coal, the total amount of fuel shipped exceeded the imports by nearly 600,000 tons. The coke industry in Belgium made practically no advance during 1906, but the manufacture of briquets showed great improvement, increasing from 52,000 tons in 1905 to 110,000 tons in 1906. Germany and Belgium are the largest manufacturers and exporters of briquets.

Coal Mining in France

The coal industry in France during 1906 was seriously disturbed by the disastrous explosion at the Courrières colliery. As a result of this accident the production does not equal that of 1905. The exports of fuel from France for the first nine months of 1906 amounted to 1,223,360 metric tons, a decrease of 78,300 tons from the figures of 1905. The imports of coal into France during 1906 were about 10 times as large as the exports.

A Nova Scotia Electric Plant

At Chignecto, in Nova Scotia, the new electrical plant of the Maritime Coal, Railway and Power Company will shortly be put into operation. Considerable interest has been aroused by the introduction of a system for using the slack coal and waste of the company's coal mines at Chignecto, for the production of electric power, to be transmitted to Amherst and other neighboring points. This is stated to be the first application of slack to the purpose of generating power for transmission to a distance, though it is often used by mines to supply electrical energy for their own operations. J. F. Wyse, of the engineering firm of Wyse & Middlemist, who has made a careful examination of the Chignecto coal properties, reports that about 20 per cent. of the coal is of low grade, disintegrating rapidly into culm, and not good enough to ship. This coal can be used for generating power, and transmission lines will carry the power to Amherst, at a distance of 6½ miles, where many thriving industries are located. A number of important contracts have been secured, and it is expected that the plant will be ready to transmit power in about six weeks.

In the first nine months of 1906 Prussia produced 95,953,110 tons of stone coal and 34,671,252 tons of brown coal.

The Uses of Bore-holes in Coal Mining

BY RICHARD LEE

The opinions of mine managers have recently undergone somewhat of a revision concerning the importance of drilling a property before final development, besides many other advantages that result from the use of bore holes. Various drilling machines have lately been introduced and some of them have met with considerable success, although nothing has yet been produced that will duplicate the results furnished by a diamond drill.

Many large coal companies now own their own drill and keep a prospecting party busy all the time with this machine. This practice is less expensive than to spend thousands of dollars in driving rock entries without knowing what the nature of the seam is on ahead. In cases where the coal bed is dislocated and the face of the fault is vertical, it is sometimes difficult to determine whether it is an upthrow or downthrow, and unprofitable exploratory work is often prevented by proving the seam with a bore hole. In this way, the operator can also determine the pitch required to drive the slope that will intersect the faulted seam.

When the workings are thought to be dangerously near a body of water or reservoir of gas, boring should always be resorted to. Into the main hole that is first drilled under such conditions, a tube about 4 ft. long, whose outer end should be provided with a flange, is inserted. Another pipe should be screwed into this flange and extend a foot or more out from the hole; a side-outlet pipe (closed by a valve) should be fitted into this extension. This side-outlet pipe points toward the floor, and when the valve is open, the water or gas is allowed to flow out. The whole arrangement should be supported by a timber frame heavily braced, and the boring tools pass through the horizontal pipes.

Other important uses to which bore holes can be subjected is to carry steam and ropes into a mine. Bore holes from 6 to 10 in. in diameter are now often put down and a substantial casing is inserted. Where holes are wet, a casing is generally needed, although in several instances, the bore holes are so dry that even steam is conveyed underground in a pipe without any other casing being put in. This latter case, however, is exceptional, and it is generally known that where steam is carried underground in an incased hole, if but a small stream of water trickles down, the condensation of the steam is so great that the pressure is often reduced more than half.

Where it is desired to have the engines on the surface and to use bore-holes as rope-ways for hoisting up an underground slope, it is best to place the two holes about 7 ft. apart, and have them 8 in. in diameter if the holes are to be more than 500 ft. deep. These holes should be cased and cemented.

At several collieries, bore-holes 5 or 6 in. in diameter are used for putting down speaking tubes and bell-wires. One 5-in. hole will accommodate two such lines laid with 2-in. gas pipe. One pipe can be used for a speaking-tube and the other for the bell-wire. The space between the casing and the gas pipes should be filled with cement.

Although bore-holes have not yet been extensively used for rescue work; the idea of their adaptability is being advanced by a number of competent coal managers. The suggestion is to use these holes to connect with safety-chambers in the mine and to carry fresh air, food and water to the miners, as well as to use them to connect the underground workings to the surface by a telephone line.

Australian Coal Trust

According to a recent U. S. consular report, all but one of the coal-mining companies in the Newcastle district, N. S. W., and the shipping companies controlling the sea carriage of interstate commodities, have been combined. There are 31 collieries and six steamship companies represented in the combination, which will control the coal mined, and will regulate the sales.

The output is to be governed by an agreement by which each mine is allowed to mine coal equal to the average annual output for the last three years. If a colliery sells more coal than the amount allotted, such colliery must pay into a fund 98c. for each ton so sold. The money in this fund will be used to compensate owners whose output does not reach the full percentage allotted, at the rate of 98c. per ton for each ton below their allotment; but the penalty imposed and the compensation made will vary with the grade of the coal, there being three grades. After Jan. 1, 1907, the minimum price of the highest grade will be $2.43; of the second grade, $2.25; of the third grade, $1.75 per ton. There is a committee of management in Newcastle and a board in London, England. Through the latter all contracts for coal destined beyond Australia are arranged.

Torrington, N. S. W., is a center from which a fair quantity of wolfram is won. In the Hillgrove district, N. S. W., some 50 miners have found constant and remunerative employment during the year mining for scheelite. The search for precious opal at White Cliffs, N. S. W., has been attended with good results, and the operations of the year have proved a considerable extension of the opal-bearing areas.

Sault Ste. Marie Canal Traffic

A late closing of navigation permitted the passage of 1,558,248 tons of freight through the Sault canals after Dec. 1. This brought the total freight passing both canals up to 51,751,080 net tons; of which 41,584,901 tons, or 80.4 per cent., were east bound, and 10,166,175 tons, or 19.6 per cent., west bound. A total of 16,475 vessels, carrying 45,180,292 tons of freight, passed through the United States canal, while 5680 vessels, with 6,570,788 tons of freight, used the Canadian canal. The total number of vessels passing the locks was 22,155, of which 18,138 were steamers, 2817 sailing vessels and 1200 were unregistered, or small craft. The average cargo carried was 2236 tons. The United States canal was open April 13 to Dec. 17, a total of 249 days; the Canadian canal, April 14 to Dec. 22, or 253 days. The average daily passage was 89 vessels and 207,004 tons of freight.

The total freight reported for the season of 1905 was 44,270,680 net tons, showing an increase this year of 7,480,400 tons, or 16.9 per cent.

The items of mineral freight included in the total were, in net tons, except salt, which is in barrels:

	1905.	1906.	Changes.
Anthracite.....	984,701	1,011,375	I. 26,674
Bituminous.....	5,524,355	7,728,255	I. 2,203,900
Total coal.....	6,509,056	8,739,630	I. 2,230,574
Iron ore.....	31,332,637	35,357,042	I. 4,024,405
Pig & manuf. iron	237,696	391,105	I. 153,409
Copper.....	106,520	107,633	I. 1,113
Silver ore.....	41	.....	D. 41
Building stone....	10,899	6,222	D. 4,677
Salt, bbl.....	423,122	468,162	I. 45,040

The increase in coal was 34.3 per cent.; in iron ore, 12.8 per cent. The table shows the great importance of the canals to the mineral interests of the country.

European Petroleum Trust

The European Petroleum Union was recently registered at Bremen, with a capital of $5,000,000. The promoters of the new company include the firms which are associated with Nobel Brothers, of St. Petersburg, and Rothschild Brothers, of Paris, together with the Deutsche Bank and others interested in the petroleum industry. According to the London *Times*, the object is to effect an amalgamation of all the European organizations for the sale of petroleum to compete directly with the Standard Oil Company for the supremacy of the continental market.

There is considerable excitement in the Island of Trinidad over the possibility of developing petroleum. Drilling is now being conducted.

It is said that 1 lb. of zirconium will supply 50,000 filaments for Professor Wedding's zirconium lamp. The life of the lamp is calculated at 700 to 1000 hours.

COLLIERY NOTES

Details in the Operation and Development of Anthracite and Bituminous Mines

Do not use emery paper for cleaning a dynamo, as emery is a conductor and may cause short-circuiting between the bars.

All motors that are installed about tipples or other dusty places should be of an inclosed type, with all bearings carefully protected.

Oil cans that are to be used around dynamos or motors should be made of brass, so they will not be attracted by the pole pieces.

When installing a dynamo or motor, the distance between the driving and the driven centers should be at least four times as great as the diameter of the larger pulley.

In operating a dynamo the copper brushes should always be lifted just before the machine comes to a stop, and should not be let down again until the dynamo is under headway.

Only very little oil should be used on the commutator of a machine. To lubricate it, grease one side of a canvas cloth, or other similar material, with vaseline, then fold the cloth and let the commutator get only what lubricant will pass through the pores.

Every dynamo or motor of 30 h.p. or greater should have a substantial foundation, separate from the walls and floors of the building. In constructing such a foundation, solid brickwork, capped with a hardwood frame, is considered best. The wood acts as an insulator, and as a cushion to take up all vibrations.

Besides the lesser costs of undercutting when mining machines are used, there also results an increased production from a specified length of working face and the employment of fewer men. One advantage thus gained is that a smaller amount of entry has to be constructed and maintained for any given output; furthermore, a mine can be developed more quickly.

For carrying electricity into a mine for operating machines and other similar purposes, many managers prefer a cable insulated with pure vulcanized rubber and covered with a protective sheath of hemp, and having a standard insulation of about 2000 megohms per mile. Concentric and twin cables may not only cause short-circuiting, but are objectionable on account of their want of flexibility.

At all mines, more especially drift mines, the connection between the fan-house and the mouth of the airway should be built most securely. If this passageway is weak and indifferently built, it is liable to be blown down by an explosion occurring in the mine, in which case the ventilation would be destroyed and serious loss of life might occur before the connection could be built up and fresh air again sent into the workings.

The form of bit most commonly used in machine drills is shaped like the letter X. Bits like the letter Z have given satisfactory results so far as boring is concerned, but are difficult to sharpen. Although an expert blacksmith under favorable conditions can sharpen and temper 30 chisel bits in an hour, there is a great demand for a satisfactory sharpening machine. Several such machines are on the market, but none have given general satisfaction.

The past year has witnessed the installation of acetylene lamps in many coal mines. The use of this kind of miners' light has met with much success and many managers are evincing considerable interest in the subject. There is no doubt but that lighting by acetylene is cheaper than any other practical method; also that the quality of the light is far superior to that obtained from an ordinary oil lamp, and no smoke is formed. Acetylene is said to consume only one-fifth as much oxygen, and gives off one-sixth as much CO_2 as an ordinary oil lamp or candle. The average acetylene lamp requires one-half pound of carbide for 10 hours' use. This means that such a light costs 2½ to 3c. per day.

In opening a new mine, one of the problems is to provide a safe haulway. More attention and expense is devoted to this subject in Europe than in America. The best practice, however, where the haulway has two tracks and is more than 12 ft. wide, is to use brick in building the side walls and arching the gangway. There is no doubt that when the life of the mine is expected to be from 25 to 50 years, this initial expense is justified. When falls of roof occur on this main entry, the daily output is often retarded. Besides the frequent expense incurred in this way, practice has proved that timber supports used in a haulway will last only from 10 months to two years while brick and stone arches put in 20 years ago stand perfectly solid at the present day.

Recently published statistics show that during the past year hard-coal miners received on an average $690.34 each. Upon examination it is found that this rate of pay to coal miners is higher than the annual wages received by the skilled and unskilled employees of nearly all other manufacturing industries. Investigations show further that the average rent paid by the miner is less than that paid by the manufacturing employee. Figures collected in the bituminous district of West Virginia and several other States show that bituminous miners are even better paid than the anthracite workers. This disproves the many reports that coal miners are poorly paid; however, the risks incurred are greater, and the employment not so pleasant as is found in other industries.

As to the advisability and economy of using machines in coal mining, much depends upon local conditions at the mine. Where the roof of the coal seam is good and requires little timber, there is no doubt that after considering the additional initial cost, machines are to be recommended. When the roof is bad, the difficulties attendant upon machine mining are: First, the difficulty of moving the machine about in a narrow place where many props are used; second, the danger of miners being caught under a fall of roof, because the noise made by the machines makes it difficult for the workmen to hear the warning sounds that occur previous to a fall of top. For this reason, it is generally best to occasionally stop the machines and listen for any sound that would indicate the working of the overlying strata.

Several years ago, much trouble was experienced by large railroads, due to the improper and careless location of vertical curves in building the lines. At this time the old-fashioned link coupling was in use, and after all the cars had been bunched together in descending a grade, when a quick ascent began, the slack due to the cars holding back often amounted to several feet in a long freight train. The consequent jerk on the last cars often caused a derailment or pulled out a coupling. Trouble of this sort is not so evident on railroads today because of better engineering practice and a different style of coupling; however, the point here brought out is deserving of the attention of coal superintendents, and should be considered in mine development. When an entry runs into a swag, it often happens that the superintendent or engineer pays little attention to properly locating and grading a vertical curve, but instead, the point marking the end of the descent and the beginning of the ascent may almost be described as an apex, so that the trip of cars, which is crowded together on the descent, abruptly lengthens out and is subjected to a severe jerk when the up-grade travel begins. On any mine road where care is exercised, there should be at least a vertical curve 150 ft. long separating the descent from the beginning of the up-grade.

THE MINES AT COBALT

Workings, Equipment, Location, Production, etc., of the Leading Shipping Mines

BY REGINALD MEEKS

With the exception of the Green-Meehan and Red-Rock properties in Bucke township all the producing mines lie in Coleman township, and are situated within an area of about 6.5 sq. miles. The country is rolling and between the hills lie numerous connected lakes emptying into Lake Temiskaming. The town of Cobalt is surrounded by a circle of producing mines, while to the south there are many others in what is known as the Kerr lake district.

The various mines are accessible by means of good, though narrow, wagon roads. All ore is sacked and brought to the cars on wagons or sleds and owing to the comparatively short distances the cost of loading is not excessive. Each mine has its own teams and about two tons are transported at a time. Since the present production of even the largest shipper is small compared with that of lower-grade mines in other districts, there seems to be no necessity for constructing spurs from the railroad to the mines, for the present at least.

In the description of the Cobalt mines which is to follow it should be stated that no reference will be made to the probable value of the mine or to mining stocks. The idea of the description is to state conditions as I saw them without reference to market conditions or possible movements of stock.

LOCATION OF THE MINES

The mines surrounding the town of Cobalt, situated in what might be termed the "inner circle," beginning at the south are as follows: McKinley-Darragh-Savage, Cobalt, Silver Queen, Temiskaming and Hudson Bay, Buffalo, Coniagas (J. B. 6), Trethewey (J. B. 7), La Rose, O'Brien and Nipissing. The Right of Way extends through the town and for a distance of four miles. Other properties within the town site are the City of Cobalt, the Nancy-Helen and the Townsite.

There are several mines, notably the Drummond, Kerr Lake, Peterson Lake Silver Leaf, and Nova Scotia, which will not be mentioned. The reason for this is not because they have no value but because time was lacking to visit the properties.

East and to the south of Cobalt there are many producing mines. There are the Colonial, King Edward, Nova Scotia, Drummond, Kerr Lake (Jacobs mine), Silver Leaf, Lawson, Hargraves, University and Foster. These mines will not be taken up in any particular order either of location or importance.

GOVERNMENT INSPECTION OF CLAIMS

What has been a menace to the district and to legitimate mining is the abuse which has been made, by unscrupulous stock-jobbing concerns and "fake" mine promoters, of the inspections by the Government, of claims before title is allowed. THE MINES ACT, 1906, states on p. 29, as follows: "No licensee shall be deemed to have acquired any right or claim under this act, or any regulations thereunder to a mining claim, unless a discovery of valuable mineral has been made thereon by or on behalf of such licensee." The term *"valuable mineral"* is defined on p. 5 as follows: "'Valuable mineral' shall mean a vein, lode or other deposit of mineral or minerals in place containing such quantities of mineral or minerals other than limestone, marble, clay, marl, peat, or any building stone, as to make it probable that the said vein, lode or other deposit is capable of being developed into a workable mine."

Unprincipled promoters in the United States flaunt an attractive advertisement in the eyes of an unsuspecting public, and make much of the fact that the claim or claims have been passed by the Canadian Government and therefore must have *valuable mineral.*

THE DUTIES OF A INSPECTOR

When a claim has been filed in the office of the recorder, the inspector visits the property, and, if staking and all other details have been properly complied with, he passes the claim, provided that, in his judgment, the vein, lode or other deposit, gives promise of becoming a workable mine. He has no fixed rule that the vein should carry a minimum value, but he has only his judgment and experience to go on, and it would be perfectly proper for him to pass a claim with a vein of calcite carrying "cobalt bloom," and perhaps a few, a very few, ounces of silver or a little smaltite. In time this showing may prove to be a mine, but the fact that the Government inspector has passed the claim certainly does not in itself prove it to be one.

FREIGHT AND SMELTER CHARGES

Before taking up the description of the mines of Cobalt it may be of interest to mention the final disposal of the ore from this district. While there are rumors of a smelter being built near the mines for the treatment of their ores, still, so far as can be ascertained, they are only rumors. Experiments are being conducted at Hamilton, Ont., which are said to be successful and moreover it is claimed that mine owners of Cobalt are financially interested in the venture. But at present all the ore is treated in three smelters, and must be hauled a long distance, and at considerable cost.

THE TOWN OF COBALT

From correspondence which I saw at Cobalt the following smelter charges were derived: The American Smelting and Refining Company agrees to pay for 94 per cent. of the silver contents, and charges a flat rate of $10 per ton. The terms are cash immediately after the agr ement of assays, and no payment is made for nickel, cobalt or arsenic values. The matte containing the nickel and cobalt becomes the property of the smelters, and it is claimed that this is shipped to

Saxony, Germany, for treatment. The shipper must also pay a sampling charge of from $5 to $6 per ton, and the freight charge which amounts to $10.20 per ton. This charge is divided as follows: From Cobalt to North Bay, $3.20; from North Bay to New Jersey points, $7.

The Balbach Smelting and Refining Company, of Newark, N. J., has a sliding scale, as follows:

Ore running 400 oz. silver.....	$6
400-500 oz.....	5
500-600 oz.....	4
600-700 oz.....	3
700-800 oz.....	2
800 oz. or more—no charge.	

They agree to pay for 93 per cent. of the silver contents at New York market prices on the day of contract, settlement to be made 14 days after agreement of assays or 1 per cent. less for cash. In this case also the shipper pays sampling and freight charges as before.

McKinley Darragh-Savage

This property, as was mentioned before, lays claim to the first discovery in the camp. The mine is situated at the southern end of Long or Cobalt lake and owns 40 acres, four of which are under water. They also own the 40 acres formerly known as the Savage mine.

On the first named property work is progressing satisfactorily. Three shafts are being sunk and drifting has been started. No. 1 shaft was sunk to a depth of 75 ft. and a 15-ft. crosscut entered the vein. Drifts have been extended 30 and 47 ft. from the crosscut and disclose a 6-in. vein running rather high in niccolite and native silver. Sinking has been continued to the 165-ft. level where drifting has been started in ore. The vein dips at an angle of 55 deg. from the vertical. No. 2 vein is very similar to No. 1 in character and dip. It is wider, however, and is considered richer. The shaft has been sunk 85 ft. and at the 50-ft. level drifting on the vein has been started. Fifty and 25 ft. on each side of the shaft has been opened and a vein from 5 to 14 in. wide was disclosed. It is claimed that at depth cobalt decreases with no diminution of silver values.

No. 3 vein is being opened by a vertical shaft, there being no dip to the vein, which has been sunk 55 feet. In this vein the niccolite occurs in smaller quantities, the values being mainly silver and smaltite. Drifting has just been started at the 50-ft. level.

Occurrence of Veins

The veins on the McKinley-Darragh occur in conglomerate and slate and strike northeast-southwest. So far no stoping has been done but five cars of ore have been shipped on development work alone.

The company is building a coffer-dam so as to cut off a portion of the lake 400 ft. long and 100 ft. wide. The average depth of this part of the lake is 17 ft. When this structure is completed the water will be pumped out and the gravel, known to be rich, will be treated in the mill which has been ordered. One vein at least is known to extend under the lake but the rich gravel is the main reason for building the coffer-dam.

The present equipment consists of two 60-h.p. boilers, one 5-drill compressor, one 6x8 hoist and one 5x5 hoist.

There have been ordered for delivery in January, two 90-h.p. boilers, one 10-drill compressor and one 8x10 hoist.

The Allis-Chalmers-Bullock Company is to install a mill consisting of a 5-stamp battery and two 8-ft. frue vanners. No mill tests have been made in the district and the results from this mill will be watched with the greatest interest by all mining men at Cobalt. The usual bunk and boarding houses, office, power-house, etc., are on the property.

The authorized capital of the company is $2,500,000, of which 2,000,000 shares have been issued, the par value being $1. The officers are: F. B. Chapin, president and general manager, A. E. Osler, secretary, G. R. McDonald, superintendent.

COBALT FROM THE LAKE

NO. 6 SHAFT AT THE BUFFALO MINE

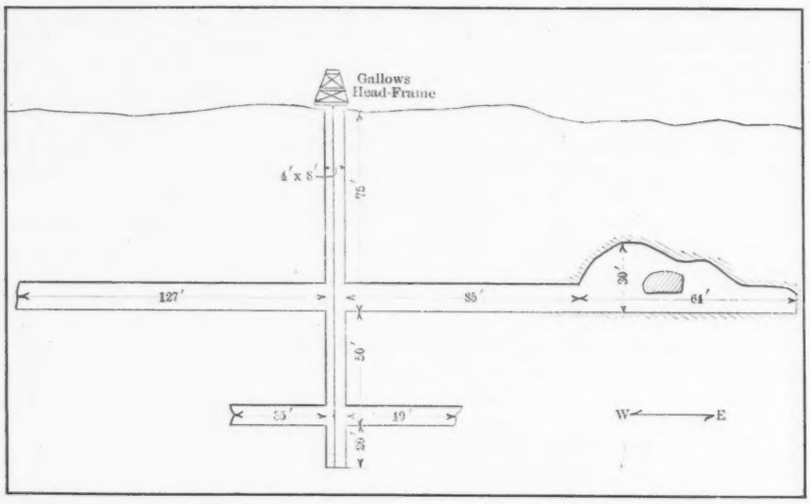
Corroborated particulars relative to the charges made by the Canadian Copper Company, at Copper Cliff, were not available, but they are said to be as follows: The smelter makes no charge for smelting or sampling, and agrees to pay for 93 per cent. of the silver contents at market rates, and also agrees to pay for cobalt, providing it is in excess of 15 per cent., and that the nickel values are low. The freight charge to this smelter from Cobalt is $5.20, or practically one-half that charged to New Jersey. There is besides a direct saving of $5 to $6 for sampling, depending upon the value of the ore. In some districts a freight and treatment charge of possibly $25 per ton, would be the determining factor between profit and loss.

I wish to take this opportunity of thanking E. N. Skinner, 71 Broadway, New York, for the use of some of the photographs illustrating the mines of Cobalt.

Cobalt Silver-Queen

Lying west of the McKinley-Darragh property is the Cobalt Silver Queen, Ltd., formerly known as the Stormont mine. The land was purchased from the Temiskaming & Hudson Bay Company and consists of 58¾ acres situated at the southwest end of Cobalt lake. Only one vein has been found and but 18 acres have been prospected. The vein strikes northwest-southeast and dips to the south at an angle of about 35 deg. A two-compartment shaft, 4x8 ft. inside dimensions, has been sunk to a depth of 145 ft. At the 75-ft. level drifting to the west for a distance of 127 ft. disclosed very poor values and to the

east the rock was of too poor a grade to ship until the drift had reached a distance of 55 ft., when the rock began to look better. From this point on the vein increased in value and at a point 85 ft. east



UNDERGROUND DEVELOPMENT AT COBALT SILVER QUEEN

of the shaft the values were high enough to warrant stoping.

WIDTH OF THE VEIN

The drift has been extended for 149 ft. and in the portion between the 85- and the 149-ft. points the vein widens from 6 to 22 in. and consists of high-grade niccolite and smaltite. The vein at the point most remote from the shaft shows a width of 22 in. of clean shipping ore.

At the 125-ft. level a 35-ft. drift to the west encountered the same barren rock as in the upper level and the easterly drift has been driven only 40 ft. Superintendent Leyson expects to encounter the same character of ore when the level has been extended 20 ft. farther. In the upper level 50x30 ft. of stoping has been done by the over-hand method, leaving a pillar in the middle.

At the bottom of the shaft, at a depth of 145 ft., is a sump. Sinking will not be continued until the lower level has opened more ground.

ORE SORTING

The ore is sorted into three grades, known as A 1, No. 1 and No. 2. The No. 2 is sacked, but none has been shipped. Five cars of A 1 and No. 1, have been shipped, and upon the results of these shipments the company declared a dividend of $120,000.

It is the intention of the management to install a skip which will dump into a car on a trestle, and this will be run into the new rock house. This house is 20x30 ft. and about 30 ft. high. All rock will be handled by gravity, and when in operation the capacity of the plant may easily be increased.

EQUIPMENT

The present equipment consists of two 60-h.p. boilers, one 5-drill compressor, an electric-lighting plant, one 6x8 hoist (to be superseded by an 8x10), bunk-house, office and boarding-house combined, blacksmith shop, storehouse, barns, etc.

The Cobalt Silver Queen is capitalized at $1,500,000, consisting of 1,500,000 shares at $1 each. The officers are: J. I. Davidson, president; F. L. Culver, treasurer, and Captain Leyson, superintendent.

Swedish Iron Ore

The Swedish government is apparently discouraging exports of iron ore. The proposal to put an export duty on iron ore failed in the Diet by a very small majority. Orders have been issued that the government railroad from Kiirunavara to the port of Narvik shall carry only 1,200,000 tons of iron ore in 1907, although the Grangesberg Company was preparing to mine and ship 600,000 tons more. The rates charged on ore over the railroad have been increased.

Much of the Kiirunavara ore goes to Germany, and the limit thus placed on exports has disturbed the German iron trade.

If all mine shafts in the Butte district, in Montana, were placed end for end they would make one continuous opening 108,900 ft. long, or 20 miles 1650 ft. These figures have been obtained by adding the number of feet in 93 shafts, and estimating the remainder at 4 miles, which may be too great. The 93 aggregate 86,130 ft. Of the total, 30 range from 1000 to 1900 ft. each, and 10 are between 2000 and 2575 ft., the deepest being the High Ore of the Anaconda Company, 2575 ft. In no mine in the district has ore been struck deeper than 2400 ft., which is the depth at which the veins have been crosscut in the Anaconda mine. The shaft on the Neversweat is 2500 ft. deep, and crosscutting is in progress at the 2400-ft. level.

Considerable deposits of mica have recently been discovered in the Vitimiribi mountains, in German East Africa. Specimens examined at Berlin have been pronounced equal to Indian mica. The yield of the mica deposits in the Oulongourou mountains, near Urogoro, has shown a notable increase of late, the exports for this year being estimated at 100,000 marks. It is said by the London *Mining Journal* that the production would have been even greater but for the scarcity of labor due to the numbers employed on railway construction.

GALLOWS HEAD-FRAME AT COBALT SILVER QUEEN

Metallics

The present tendency among metallurgists appears to be to do away with the process of briquetting fine ore, substituting therefor a sintering of the material. This has been done very successfully, in a special apparatus, at Cananea, Sonora, and at other places. The American process of pot roasting is really a species of sintering process.

The smelting works of the Amalgamated Copper Company at Great Falls, Mont., are being enlarged so as to have 25 to 40 per cent. increased capacity. The improvements are being made closely along the lines of the Washoe works, i.e., extraordinarily large blast furnaces and reverberatory furnaces. In connection with the latter, however, producer-gas firing will continue to be used.

The bisulphide of iron may be changed into the magnetic oxide if it be roasted carefully at dull red heat. Practically, however, it is difficult to obtain all of the iron in that form and it is sometimes necessary after the sulphur has been removed to introduce some carbonaceous matter so as to reduce the ferric oxide to magnetic oxide. When the iron is present originally as ferric oxide, as in limonite ore, a similar reduction by carbon may be necessary.

The separation of blende from other minerals is accomplished with great success by the aid of magnetism; since the introduction of the Wetherill separator this has been done even with minerals which display no marked magnetic properties and cannot be converted into magnetic forms, for example, certain kinds of blende can be separated thus from both pyrite and galena. The mixed sulphide ore of Broken Hill, N. S. W., and of Leadville, Colo., is treated successfully in that manner.

In Western lead-smelting practice the use of concrete for the smoke and dust-settling flues has been found unsatisfactory, because of its liability to crack. The dangers pointed out in a recent discussion in the *Transactions* of the American Institute of Mining Engineers, appear to have fully materialized. In the more recent constructions, the flues are being built of brick, the arch having the form of an inverted catenary, the same form that has been used in connection with the concrete flues of Monier construction.

When siderite is calcined it is decomposed according to the reaction $FeCO_3 = FeO + CO_2$ and the molecule of FeO is subsequently converted to Fe_3O_4 by taking oxygen from the air. The roasted carbonate is always strongly magnetic, but in execution of the process the temperature must be regulated carefully to avoid sintering the ore, which because of the fusibility of ferrous oxide and silica may easily happen. According to Le Chatelier the decomposition of ferrous carbonate takes place at 800 deg. C.

The process of pot roasting employed in the various plants of the American Smelting and Refining Company has not proved to be entirely satisfactory, chiefly because of the slowness of the operation (about 18 hours being required to desulphurize a charge), and the large percentage of fine material that is produced, and has to be reworked. There is evidently a distinct difference in the behavior of the ore subjected to this process and the behavior of galena ore, mixed with limestone, in the Huntington-Heberlein process, from which the process of pot roasting was developed in America.

The smelters of Kansas conducted their early experiments on the smelting of Colorado ores with many discouraging experiences, but after a few years they succeeded in treating them profitably, and drove the European buyers out of the Colorado market. The increased price for spelter, the continuing shortage of ore, and the severe competition for what Joplin could supply forced these smelters more and more into the country west of the Rocky mountains for their ore supply, and raised the prices for such ore, in which the smelters were aided by gradual improvements in their processes.

Iron sulphide, carbonate and sesquioxide may under certain conditions be converted into the magnetic oxide, Fe_3O_4, in which form it is easily attracted by the magnet and thereby may be separated from compounds of zinc, all of which are non-magnetic, or at least only feebly magnetic. Processes depending upon this principle were first applied many years ago, perhaps as early as 1855. Similarly iron bisulphide may be changed into magnetic sulphide. The conversion of non-magnetic iron minerals into the magnetic forms requires considerable care and many failures have been due to ignorance of the correct conditions.

For certain purposes, such as the blowing of cupola furnaces, a comparatively small volume of air is required, but under high pressure. For exhausting, blowing boiler fires, and the like, the volume required is greater and the pressure relatively less. The former wheel requires to be narrow at the circumference, thus providing for the escape of only a small amount of air. When a fan is employed for exhausting hot air or gases, the speed required to maintain a given pressure difference is evidently greater than that necessary when cold air is handled, the difference being due, and inversely proportional, to the absolute temperature.

Stringent rules for the handling of explosives have been adopted by the Pennsylvania Railroad. Only cars in good condition and of at least 60,000 lb. capacity may be used for this purpose. Such cars may not be placed in a train nearer to each other than five car lengths, and if possible must not be within 15 cars of the engine and 10 cars of the caboose. No cars loaded with explosives will be allowed in a mixed train. The cars at either end of the one loaded with explosives must not be loaded with oil, lumber or other inflammable material, nor iron bars, pipe or other articles likely to break through the end of the car from rough handling. Cars containing explosives must be inspected by the trainmen each time the train stops.

At Bendigo, Victoria, mechanical ventilation as an auxiliary to natural ventilation is operated to a large extent in all the mines, says a correspondent of the London *Mining Journal*. The deepest mines use a water jet to lay the dust from boring machines. Water for this purpose is usually brought from a cistern in the shaft at from 300 to 400 ft. above the lowest level that is opened from it. Sometimes the faces are upward of 2000 ft. or more from the shaft, but a pipe of 1 in. diameter is usually found sufficient, with such heads of water, for one "end." Hoses are attached at the service end. The greatest distance to which air is supplied by a rotary blower (Root's) is 4710 ft. This is at the Band & Loch mine, and includes the whole distance covered by air pipes from the surface to the faces at the 2300-ft. level. The Star of the East mine has 12-in. air pipes carried to faces at 1900 ft. from the shaft. Some years ago, in an alluvial mine known as Winter's Freehold, in this district, one rotary blower was operated to ventilate faces at over two miles distant from a shaft 400 ft. in depth.

In calcining blende-siderite ore, to make the siderite magnetic, it is necessary to expose the ore to a bright, cherry-red heat (850 deg. C.) for only 10 to 20 minutes. The particles of siderite blacken and become so strongly magnetic that comparatively large pieces can be lifted by a very small horse-shoe magnet. The ore loses weight through the expulsion of the carbon dioxide of the siderite and the second atom of sulphur of any pyrite that may be present, but the heating should not be prolonged so as to cause the blende to roast. The ore is withdrawn from the furnace red hot, and emitting a strong odor of sulphur dioxide, but the latter disappears immediately and the particles of blende are observed to be coated with an infinitesimal film of white zinc oxide. These are evidences of a properly conducted calcination. When the calcination has been properly conducted, the siderite can be lifted out by a magnet of extremely feeble intensity and a very clean separation can be made from the blende. A low intensity of magnet is desirable not only because of its less consumption of electrical power, but also because a higher intensity of magnetism may lift out some of the blende, when the latter contains combined iron.

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**Illustrated*

The Gold Movement

In the JOURNAL of Jan. 5 reference was made to the large production of gold in 1906, and some effort was made to trace the disposition made of the great sum thus added to the world's wealth. The total, according to the preliminary figures, was $404,650,000; and of this the United States production was $97,650,000, or one-quarter. This did not represent the whole addition to our gold stock by any means, for the net imports into the United States for the year were $103,120,000; so that a little over $200,000,000, or about half of the total production, came to this country. Most of these imports were drawn from Europe, though we received some gold from Mexico, and also a considerable proportion of that produced from the Yukon placers in Canada.

There were several causes which determined the movement of gold in this direction. Sales of American grain, cotton, copper and other materials in Europe were unusually large. The known business activity and the rapid growth of trade and development of the country tended to increase foreign investments here. The San Francisco disaster brought considerable sums, in payment of the losses incurred by foreign insurance companies. Finally, the growth of trade and speculation was so great that still more gold was needed to sustain credit, and this country was able to offer interest rates high enough to attract capital from the European markets. The exact amount of foreign loans made here cannot be easily ascertained, but it was certainly large. This money, of course, will have to be repaid in time, either directly in money, or in produce exported; but this will extend over a considerable space of time, unless a panic should intervene, which does not now seem probable.

All the Americas, indeed, as well as the United States, took gold from Europe last year. Canada has entered on a period of rapid growth and development, and drew largely from Great Britain in the way of capital for new railroads, and the purchase of lands, and in money brought by immigrants. Mexico sold silver for gold to help on the gradual change in its currency and money standard. In South America there were heavy imports, the chief causes being large grain exports from Argentina and heavy investments of European capital in that country; and the so-called "coffee valorization" plan in Brazil, which involved heavy gold loans by the government to aid its efforts to regulate the prices of coffee. It is a curious reversal that Mexico and South America, which supplied Europe with great quantities of gold in the sixteenth and seventeenth centuries should, in the twentieth, be reversing the process and drawing gold away. The total gold exports from Great Britain to Argentina last year were $17,029,000; and to Brazil, $10,330,000. Besides this both countries took some gold from France.

Another determining cause of gold movement last year was found in the efforts to repair the waste and loss of the Russo-Japanese war. Both Japan and Russia borrowed large amounts of gold in Europe; and Russia would probably have borrowed much more, had not domestic troubles seriously impaired her credit. This cause for the absorption of gold has not yet disappeared, by any means; it will probably be a factor for several years. The destruction by earthquake at Valparaiso and Santiago in Chile, where European capital is largely invested, is also worth mentioning, though it will be a more apparent factor in 1907 than it was in 1906.

The great absorption of gold by the United States may be considered as at once a cause and a consequence of our growth and business activity. There is a strong probability that it will continue during the present year, or at least a considerable part of it. No country in the world is growing so rapidly in population, or in the development of its resources. While these movements continue the country will be in a position to command the capital it needs.

The Nipissing Company

Considerable surprise has been expressed at the failure of the Nipissing directors to publish in full the report on the property recently made by H. W. Hardinge, only brief extracts of this having been given out, although the report itself is open to the perusal of stockholders at the office of the company. We surmise that this action is due to the feeling that the report is of such optimistic character that if it were published the directors would be charged with attempting to boom the stock after having intentionally

depressed it, a manipulation of which indeed they have been freely accused.

We have reason to believe that Mr. Hardinge's report is in fact of an optimistic character and straightforwardly expresses great confidence in the future prospects of the company and of the district as a whole. There is no question as to the wonderful mineralization of the district, where many crevices, which may be compared to shrinkage cracks, have been enriched with silver ore of extraordinary richness over a wide area. The formation is such that the sudden disappearance of a single vein should cause no alarm, indeed is to be expected. On the other hand, it is to be expected that many blind veins, i. e., veins which do not come to the surface, will be found. In the veins there will be found local enrichments and conversely lean spots. Vein 49, of which so much has been said, has not petered out. At the bottom of the cut the ore is of lower grade than higher up, but there is more of it. In other words, as the grade has gone down the ore has thickened, which is a common occurrence.

We think that the directors of the Nipissing company make a mistake in not publishing Mr. Hardinge's report. The company is one in which many persons are interested, and they are entitled to full information. Mr. Hardinge is an engineer of such high reputation that no excuse for the honest optimism of his report is required, and there is no good reason why its publication should be misconstrued.

There are already signs of a revival in the general mining interest and in the Cobalt stocks. The Nipissing affair has done much to clear the air. There is talk of the appearance of new figures in the Nipissing company, which may relieve it from some of the suspicions connected with the old. It is to be hoped that investments in the Cobalt stocks will now be considered on a more rational basis than a little while ago. The district has merit and ventures in its mines are attractive; at present they can be safely regarded only as highly speculative. Until more is known as to the character of the mines it is ridiculous for even the dividend-paying stocks to be bid up to the 8 per cent. basis, which is reasonable only in the case of mines with a large supply of ore developed.

Mining Stock Exchanges

We have chronicled the rise and fall of many mining stock exchanges. History has shown very clearly that such marts can continue to exist only when there is a real need for them. When they are organized as a means for unloading worthless stock upon a gullible public, or degenerate into that, they quickly die.

The Boston Stock Exchange is the best modern American example of an honest mining stock exchange, which is thriving and active because there is a real need for a place where legitimate investments can be entered into and disposed of. Nominally the Boston Stock Exchange is a good deal more than a mining stock exchange, but since Boston lost its railway interests, the trading on its exchange has been chiefly in mining and a few industrial stocks.

The gigantic growth of trading on the New York curb is proof positive of the need for a mining and industrial exchange at New York. The mart is already here, but it lacks the organization and rules that experience has shown to be necessary. This has been because the New York Stock Exchange will not permit its members to have dealings on any other exchange in this city, and many of its members are active on the curb. Consequently the curb is a place where "admittance" is easy, and while many highly reputable securities are traded in, there are many which are foul. Many evil practices have developed. For all of this the New York Stock Exchange is to a considerable extent responsible, because it has been unwilling to permit the curb to organize.

Now the Produce Exchange, which is an old and reputable organization, is making arrangements to list mining and industrial stocks. There is every reason to believe that its management will be commendable, although its plans have not yet been announced. Its importance as a mart will depend chiefly upon the way it is managed, and the attitude of the New York Stock Exchange toward it. If the latter extends its coöperation the curb could be practically wiped out—a consummation to be wished. If the curb continues to exist the New York Stock Exchange will be responsible. There is no real conflict of interest between the two exchanges, and it ought to be possible to devise a suitable *modus vivendi*.

The United Engineering Building

On Tuesday evening, Jan. 8, 1907, the American Society of Mechanical Engineers held an informal meeting in the auditorium of the Engineering Societies building, to listen to a paper by F. P. Fish on "The Ethics of Trade Secrets." In introducing the speaker the president, Professor F. R. Hutton, stated that the meeting was strictly an informal one, and that the official opening of the building would be held in April, 1907, at which time the donor, Andrew Carnegie, was expected to be present, and all of the societies would take part in the exercises. In the meantime it was unnecessary to keep the finished building closed until the later date. The president announced that the various societies expected to hold informal meetings once a month, and that the American Society of Mechanical Engineers would meet each second Tuesday.

Mr. Fish then read his paper. He outlined the methods of guarding trade secrets used in former times, and took up the moral and legal obligations of employees in respect to their employers' secret processes, and cited cases wherein redress had been obtained for divulgence of such secrets. The speaker discussed the advisability of patent protection, as compared with keeping processes secret, and stated some of the advantages of each.

After the address the audience remained seated, while a flash-light photograph was taken. The meeting then adjourned to inspect the building.

Everything which could add to the comfort and convenience of the societies has been thoroughly carried out. There are large connecting offices on several floors for the use of the officers, and on the thirteenth floor there is a large reading room, convenient to the library shelves. Throughout the building are a number of small lecture rooms, and on the third floor is the auditorium, with a balcony and a seating capacity of about 1000. The lighting and acoustic effects are exceptionally good.

The woodwork throughout the entire building is finished in "fumed" oak, and the floors are rapidly being covered with oriental rugs, linoleum or the hard wood is left uncovered. The coat-rooms are situated on the second floor and are spacious.

The entrance to the building opens into a large lobby finished in mottled green marble and furnished with rugs and red leather furniture. There are two bronze tablets, one showing a portrait in bas-relief of the donor, Andrew Carnegie, above his letter of 1904 offering to donate one and one-half million dollars; the other contains the combined seals of the engineering societies amalgamated under one roof. The lighting of the building is effected by incandescent lamps hidden in the ceiling.

Portland Cement

BY ROBERT W. LESLEY*

In the United States the cement industry has prospered to a degree that would seem to justify indulgence in the alleged American propensity to boast. Taking into consideration the brief period that has elapsed since America was entitled to be called a cement-producing country, the record of the industry stands without a parallel. One has merely to recall the fact that 82,000 bbl. of portland cement comprised the output in 1880, and to be told that the estimate for 1906 has been placed at the enormous total of 42,000,000 bbl. or more to be convinced that the development of the industry in this country has been truly marvelous. To present the matter in another form, the estimated output for 1906 would mean a per capita production of a half barrel of cement for every man, woman and child in the United States, whereas the output in 1880 distributed in like proportion would not have supplied the residents of a single city of the size of Washington. It is in looking at the situation in this light that the true perspective is obtained.

The great growth of the cement industry from the manufacturer's standpoint was the natural sequence of the remarkable development of the uses of cement. The United States stands preëminent in this respect if measured by the quantity used. Her engineers and builders were not content to be entirely on this side of theory and experiment, but possessed the courage of their convictions, and thus the work of the builder has kept pace with the research of the laboratory.

DECLINE IN IMPORTS OF CEMENT

Grouping imports under the term hydraulic cements, there is shown a marked decline in imports. The following figures indicate what took place up to 1906, when domestic consumption reversed the figures:

IMPORTS OF HYDRAULIC CEMENT INTO THE UNITED STATES IN 1903-1905.

[Barrels.]

COUNTRY.	1903.	1904.	1905.
United Kingdom...	146,994	16,365	33,978
Belgium	737,576	394,368	335,154
France	14,866	34,912	18,864
Germany	1,377,414	585,563	456,325
Other European	27,415	7,538	602
Canada	4,421	566	417
Others	9,265	7,091	1,237
Total	2,317,951	1,046,403	846,577

It is interesting to contrast with this the table of exports from 1903 to 1905. The figures are as follows:

*Vice-president, American Cement Company; editor of *Cement Age;* Philadelphia, Penn.

EXPORTS OF DOMESTIC HYDRAULIC CEMENT, 1903-1905.

[Barrels.]

Year.	Quantity.	Value.
1903	285,463	$ 433,984
1904	774,940	1,104,086
1905	897,686	1,387,906

The demand for cement in 1906 changed the figures. The exports for 10 months ending October, 1905, were 877,516 bbl., and imports 656,337 bbl., while the exports for the 10 months ending October, 1906, were only 480,318 bbl. and imports 1,686,426 bbl., thus showing the marked increase in domestic consumption.

ENORMOUS CONSUMPTION

There is cause for congratulation upon the situation in the United States as matters stand at present, and it is entirely within the scope of probability that official figures covering the current year will show the large estimates already made to be far under the mark. Certain it is that both the production and uses of cement are constantly increasing, and not solely because of great enterprises like the construction of the Panama canal, the reclamation of deserts and the rebuilding of cities, but because there is growing appreciation and understanding of the value of cement. The last has operated to give the cement trade a tremendous impetus in the United States. It can best be likened to the early development of our great railway enterprises and probably its true explanation is what has happily been termed the initiative impulse of the American people. Where other nations have manifested the conservative spirit which waits upon the decree of the scientist and the laboratory, the people of this country have been quick to discern the practical value of cement, and the immense demand following its successful application in large structural enterprises a few years ago has been doubled and over to meet the needs of practically every community in the United States. Not only does America easily take first place among the cement producing using countries in the world, but so unprecedented is the demand for cement and so thoroughly established is the industry that no one can safely predict its future magnitude. A potent factor in all this has been the gradual decline in the cost of manufacture and the selling price as compared with the situation of the early nineties. The wide distribution of the industry has been another important consideration. It has afforded the people generally an opportunity to become familiar with the many virtues of cement and concrete construction and it is now extensively used in communities in which a barrel of cement would have been a novelty a short time ago.

FUTURE OUTLOOK

To reflect upon the development of the past few years is to become convinced that, after all, this country has merely crossed the threshold in the evolution of the cement industry. Cement in factory construction may be said to have fairly begun. In the matter of dwellings and kindred structures the field has scarcely been touched. Granting that there can be no further saving effected in the cost of production, no increased competition in manufacture and that progress in structural methods is about to cease, even so, under present conditions, the use of cement must increase far beyond the present output. In a recent interesting review of the American portland-cement industry, Richard K. Meade says: "Few people realize how much concrete construction is done in the United States. If all the portland cement made in this country last year (1905) had been used for sidewalks, these would have been equivalent to a sidewalk over 16 ft. wide, reaching entirely around the world at the equator. If this same cement had been made into a solid cube of concrete, an edge of this would be 3/16 of a mile in length." Mr. Meade's interesting illustration of the sidewalk suggests that American cement is finding its way around the earth since we have become exporters instead of importers. In many foreign countries American consuls write home urging our manufacturers to invade the field, and it can only be a question of time when they will enjoy a full share of foreign trade. The demand at home has been such that comparatively little attention has been paid to foreign markets, but with factories springing up in all sections of the country to meet local demand it is altogether likely that new territory will soon be invaded. To sum up the situation briefly, America has first and foremost a large home demand. Cement is sold at a reasonable price within the reach of all classes of consumers, but at a price which allows a fair profit to the manufacturer. The consumption of cement is constantly expanding, but the establishment of new factories precludes the probability of exorbitant prices. Viewed from every standpoint the cement industry in this country appears to be on a substantial and wholesome basis.

Cobalt Companies

The number of Cobalt mining companies which have obtained Ontario charters of incorporation now amounts to 249; in addition to which, 14 companies incorporated elsewhere have been licensed to operate in the province. The Ontario capitalizations amount to a total of $171,148,000. At the price paid by the public for shares in some of the larger companies the selling price represented is estimated at about $250,000,000 in all.

The London Copper Market in 1906

SPECIAL CORRESPONDENCE

The year opened very auspiciously, trade having lately expanded in all directions. Metals generally had advanced in value, in consequence of genuine trade demand, and stocks were everywhere light, with no prospect of early repletion. As regards copper, the total visible supply stood at the low figure of 12,983 tons. The leading producers had already disposed of their output—largely or wholly—for some months ahead. Threatened re-sales of large quantities which had been shipped to China proved eventually to be insignificant. The political and industrial ferment in Russia, which had been the one disquieting feature, already showed welcome signs of abatement, and confidence was imparted to the Stock Exchange in consequence. The opening prices for standard warrants were £79 15s. for spot, and £79 7s. 6d. for three months, and there was an active demand for refined and manufactured sorts, all at full prices. The market was forthwith affected, partly by speculative holders, who desired to realize, partly also by "bear" selling. This latter feature developed strongly under the disturbing announcement of a general election, and under the political uneasiness caused by the Moroccan question, which at one time threatened to become acute. Under these adverse influences, three months' standard gradually relapsed until £75 12s. 6d. was recorded, a loss of £4. Spots warrants meanwhile were firmly held; and as bear sales matured, the premium on these warrants was at one time as much as £2 5s. per ton. Thereafter the standard market was less active, the speculative element having subsided; but the tendency was firm, and the statistical position favorable. A recovery of nearly £2 was recorded in the price of three months' standard before the month closed, when spot warrants stood at £78 10s., and three months' at £76 17s. 6d.

February opened with a firm tendency induced by further shrinkage in the visible supply; but an early relapse followed, due to large realizations combined with the pressure of bear sales, which brought down the price of three months' standard to £74 15s., only to be followed by a sharp recovery to £76. Thereafter bears showed more caution, in view of active consumption, firmness on the part of producers, revival of demand for sulphate, and further depletion of stocks. The market was steady in consequence. One or two transitory relapses toward the end of the month were only the signal for renewed enterprise, followed by advanced prices. Spot copper continued to be firmly held, and to command a premium. It was abundantly evident that the market was heavily oversold, and that the official American prices were merely nominal, holders refusing to accept them. The month closed with improved demand for consumption, with spot warrants at £78 15s., and three months' at £77 2s. 6d.

March opened with every indication of firmness, prompted by three successive advances in American prices, as also by the statistics, which disclosed a visible supply of only 8946 tons. Producers of refined copper had already sold largely and were unwilling to increase their commitments unless at a substantial advance in prices. Manufacturers who had held back in hope of lower prices, now hastened to cover their requirements, and the demand for consumption was consequently brisk and at full prices. This was particularly noticeable in America, where consumers readily bought for delivery over April-June. The covering of bear sales, which had been less active in the early part of the month, developed new importance toward the end. By this time the prolonged Moroccan dispute had been satisfactorily adjusted, and the political situation was free from disturbing elements. Stocks in English warehouses were computed at the dangerously low figure of 4783 tons. The market was fully responsive to these influences, and the month showed a steady advance in the standard cash price from £79 at the outset to £83 15s. at the close, three months' warrants closing at £80 17s. 6d.

April showed early evidence of confidence, evinced principally in increased orders for standard copper for forward dates, both from speculators and consumers, and a gradual advance in values was recorded throughout the month. At one time the speculative market was neglected in favor of tin, in which there was considerable excitement; then followed the usual cessation of business at Easter, and the general dismay caused by the appalling disaster at San Francisco; but at no time was there any great pressure to sell. On the contrary, bears were active in covering their sales; investors also bought largely. India sent large orders for yellow metal and copper sheets; tubes and fire-box plates were in good request for locomotives; the electrical industries continued to take large quantities in wire and other forms, and the American demand was such that by the end of the month the leading American producers had practically sold their output up to July. The standard market consequently closed strong, with cash warrants at £85 5s., and three months' at £83 5s.

May opened with a downward tendency, due to disturbing influences in American finance, and during the first eight days the value of spot warrants relapsed gradually. Producers, however, were well sold and would make no concessions, though second-hand holders were restive. Refined copper continued in good demand for consumption, notably in Germany and chiefly for electrical work. American consumption was no less active, and it was known that the Amalgamated company had sold largely for delivery extending into July and August. The situation was therefore ripe for improvement, which commenced early in the month, by which time the financial outlook had greatly improved. With the approach of the Whitsun holidays the turnover dwindled, and operators hesitated to initiate any movement either way. Closing prices were, for spot standard warrants, £85, and for three months', £84 10s.

June opened quietly under holiday influence, but with favorable indications of general trade. The long impending labor troubles in Germany were happily averted, American trade gave plentiful evidence of increased expression, and producers had everywhere sold well ahead. Values gradually advanced until, on June 12, spot warrants commanded £86 5s., and three months' £85. By this time demand was temporarily satisfied, and the disquieting aspect of Russian affairs tended to disturb the money market. Bears were alert to take advantage of the opportunity, and no support was forthcoming. Meantime there was some active business in spot warrants which were in request chiefly for the covering of bear sales, but later values relapsed in the absence of any pressing demand, and under unfavorable reports from Wall street, where industrial shares were sharply attacked. The close of the half-year was thus naturally quiet, in view of general stock-taking, and little attention was given to copper. There was, however, a manifest disposition to buy in the neighborhood of £80, and producers would make no concessions. Closing values were £81 5s. for cash standard, and £80 10s. for three months'.

July opened uneventfully, with little speculative enterprise. A further increase in the visible supply, and a general depression in the stock markets, combined to initiate a gradual decline which, followed by heavy liquidations induced by losses on tin, brought down the prices to £78 5s. for cash, and £77 15s. for three months' warrants, at which figures the market closed, July 13. At this point support came in, notably from America, where the stock markets had become more buoyant and operators noted London as the cheapest source of supply. Offerings, however, were small, and it was obvious that there was no real surplus of material in the market, while consumers generally were working down their stocks with every prospect of having to replenish shortly on a large scale. American prices meanwhile were steadily maintained. Toward the close of the month the market became free of extraneous influence, and stocks were strongly held. Manufacturers bought largely, and raised their basis price for the rolled metal by £2 per ton. Bears became alarmed, and hastened to cover their commitments. Pressure by this time was eased, and speculative accounts mostly

closed in view of the statutory holiday in the first week of August and of the customary exodus of holiday makers at that season. Consumers' demand continued brisk, and the month closed with cash warrants at £82 10s., and three months' £81 10s.

August was an active month throughout, marked by increased evidence of large requirements extending over long periods, with consequent bookings in many cases extending into the next year, and at persistently advancing prices. One natural result was the early disappearance of the backwardation, which had ruled so long. Aug. 13 found the price uniform for cash, three months', and intermediate dates, and thus it continued for the rest of the month, with sometimes a fractional premium for the later dates. The speculative element gradually dwindled so that the public turnover was often very meager, and official prices little more than nominal, but the consuming industries were none the less active in absorbing all that offered. German consumption, in particular, was on a larger scale than had hitherto been known. India supplied numerous orders, contrary to her custom when prices are high, and China did likewise. The home consumers alone showed any timidity, for which they had to pay the penalty after their stocks were worked down and replenishment could no longer be delayed. By the end of the month American producers had sold immense quantities and had to hold for advanced prices. Other producers were similarly situated, and stocks in public warehouses were ominously low, with every indication of consumption outrunning supply. There was a slow but steady advance in prices all through the month, closing at £85 5s. for cash warrants, and £85 7s. 6d. for three months'.

September fully justified the optimistic opinions based on the foregoing indications, and a steady advance was registered throughout the month. Leading producers had already sold out for some months ahead, consumers' requirements were in many cases only partly covered, there was but little of the metal left in dealers' hands, and consumption had obviously overtaken supply. It soon became known that Japanese supplies had been liberally taken for the first half of 1907, and that consumers had secured important contracts extending well into the spring. As the month advanced, important orders came in from India and China, and inquiries were received concerning large quantities required for government and railway work. Toward the end of the month events developed rapidly, and it was manifest that manufacturers were committed to a larger output than production could furnish. Bears hastened to cover—in most cases at heavy loss—and bulls were no less prompt in paying the already advanced price for forward warrants. Speculation, however, was comparatively unimportant beside the enormous business passing between producers and consumers. New York prices were raised almost daily, and a heavy tonnage of American copper was booked for delivery over January-March. Home consumers were for the most part late in apprehending the real significance of the situation, and in some cases they paid full prices for delivery up to June, and even beyond. Sulphate of copper was in good demand, and manufacturers had to draw upon the scanty supply of raw material in public warehouses—a source already depleted by large exports to the European continent. The closing prices of standard copper were £91 5s. for prompt delivery, and £91 for three months'.

October opened with a sharp advance to £93 for all deliveries, followed by a slight check due to bear enterprise, which latter was, however, quickly closed at a loss in a market which was too strong to justify such attacks. American prices were early advanced, most producers having already sold out for February, and in some cases for March. There was furious buying in the English market, particularly of refined sorts, and outside speculative operations intensified the excitement. Progress was rapid until, on Oct. 16, the round figure of £100 was paid, as had been long predicted by a leading authority. On Oct. 18, £103 10s. was paid, and this proved to be high-water mark. Thereafter enterprise was sobered somewhat by the official bank rate of interest being raised from 5 to 6 per cent., as also by the failure of a prominent city house having large commitments in copper on the bear side. Brokers hastened to cover their liabilities in this direction, and tension was relieved by the liberality with which holders met this demand. Meanwhile American finance became disturbed, causing a fall in negotiable securities, and prompting bear selling of copper, whereby prices were forced down to £97 5s. on Oct. 25. Consumers naturally held aloof, but their requirements were obviously large, while there was nowhere any indication of any appreciable expansion in production. Thus the selling power was soon spent, weak bull accounts were liquidated—thereby eliminating an element of instability—while the outstanding bear accounts sufficed to impart strength to the market. The month closed in comparative quietness after recent feverish activity, and with practically the entire production of the metal engaged for four months to come. Closing prices of standard warrants were £97 for cash, and £97 15s. for three months'.

November was clouded at the outset by uncertainty connected with the New York election, on which important commercial issues were supposed to hang. The result was judged favorable though not inspiring, and the market improved accordingly. It soon became known that American consumers had bought Lake Superior and electrolytic copper to the extent of about 20,000 tons which, in conjunction with other business, rendered producers independent for some considerable time. The financial situation also improved, and prompted a revival of speculative interest in the metal. European consumers showed some reserve, and their inquiries were spasmodic, but the volume of business increased with each advance. Top prices were recorded Nov. 19, when cash warrants commanded £102, and three months' £103 5s. A slight reaction followed, but American advices continued optimistic, with urgent calls for delivery, and with demand only partly satisfied even at the high price. Nov. 21 cash warrants closed at £100 15s., and three months' £102, but further bear attacks were repulsed, and the market thenceforward strengthened with increasing demand for refined sorts and in the absence of any indication of increased production in the near future. The month closed with every sign of prices advancing further, cash warrants being quoted £102 10s., and three months' £103 7s. 6d.

December amply justified the foregoing estimate of the situation, the advance being persistent and with few interruptions. Early in the month the American quotation reached a high point. At the same time came tidings of the partial destruction of the Arizona Copper Company's smelter by a disastrous flood, indicating curtailment of production in that quarter. The next remarkable episode was the sale of over 2000 tons by the Rio Tinto Company at the record price of £110, for January and February delivery, besides a large volume of miscellaneous business with consumers. Toward the middle of the month it was found that electrolytic copper was practically unobtainable for earlier delivery than April, demand being particularly keen for this class of copper. Speculative business also became lively, and a large bull account was manifest toward the close, whereby a contango of 30s. was established for three months' warrants of standard. Even the Indian markets—which usually offer a passive resistance to a high range of prices—now found outlets for appreciable quantities of manufactured material, while demand from the European continent—especially from German manufacturers—was very brisk. Toward the close there was considerable stringency in the money market, which tended to restrain the advance in prices, and the approach of the Christmas holidays restricted the volume of business. The open market may be said to have closed on Dec. 21 with a very firm tendency, cash standard being held for £106 15s., and three months' for £108 5s., or 30s. above spot.

For the first nine months of 1906, Germany imported 333,600 tons of pig iron as compared with 271,400 for the corresponding period of 1905.

Personal

Mining and metallurgical engineers are invited to keep THE ENGINEERING AND MINING JOURNAL informed of their movements and appointments.

R. B. Brinsmade has been examining mines in northern Kentucky.

W. A. Pritchard, of San Francisco, is in Mexico on professional business.

John B. and Fred G. Farish, of Denver, are both in Mexico on professional business.

J. G. McConnell, of Chicago, has been in Gilpin county, Colo., looking after mining interests.

James Ross, president of the Dominion Coal Company, Sydney, N. S., sails for Europe Jan. 19.

W. W. Degge, of Boulder, Colo., has been out to the Goldfield, Nevada, district, looking after mining interests.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, has returned from a business trip to Europe.

C. W. Kempton, mining engineer, left New York Dec. 21 for Chile, South America, on professional business.

Percy E. Barbour has gone to Goldfield to look after interests of Boston people. He will be in Nevada several months.

W. H. Knowles, of Denver, Colo., left this week for the Greenwater district, California, in the interests of Easterners.

A. H. Wethey, manager for W. A. Clark, at Butte, Montana, has been a recent visitor in New York. He returns to Butte this week.

Theo. L. Lammers, of Spokane, Wash., has been appointed general manager of the Panhandle Smelting Company, Ltd., of Ponderay, Idaho.

G. W. Miller, of Denver, Colo., is now engaged in making examinations of mining properties in northern Colorado, for New York people.

Arthur P. Heinze, brother of F. A. Heinze, is spending a few weeks in Butte in the interest of the mining property in which he is connected.

George Wesley Davis, a director in the Davis-Daly Estates Company, has returned to Butte, Mont., from a business trip to Boston and New York.

Victor Rakowsky, of Duluth, consulting engineer for the Butte & Superior Copper Company, is in Butte, Mont., on business connected with the company.

Harry A. Lee, formerly commissioner of mines for the State of Colorado, has been made consulting engineer for the Unity Mines Corporation, of Alta, Utah.

We shall be obliged if the contributor who favored us a little while ago with an article on "Determination of Sulphur" will send us his name and address.

Hugh D. Pallister, mining engineer, formerly of Cleveland, Ohio, has become connected with the Chisos Mining Company, of Terlingua, Brewster county, Texas.

R. R. Lund, of Breckenridge, Colo., has gone to Leadville, Colo., where he has accepted a position as chemist with the American Zinc and Extraction Company.

J. E. Lemay, a banker of Montreal, Canada, has been visiting in Routt county, Colo., and has become interested in some mining property in the Hahn's Peak section.

Robert Linton, of R. M. Atwater & Co., Helena, Montana, accompanied by R. de Sallier, has just returned from an examination of property south of Goldfield, Nevada.

Donald B. Gillies, manager of the Tonopah Extension property, and the confidential agent of Charles M. Schwab, spent several days in Butte, Mont., recently.

C. F. Moore, of Salt Lake City, is in Mexico, in connection with the Real del Monte mines, Pachuca, of the United States Smelting, Refining and Mining Company.

A. J. Smith, of Denver, a well-known operator in Gilpin county, left recently on a trip to New Mexico, to look at some mining properties, in the interests of Eastern people.

George E. Howard, for some time past assistant manager of the Sahuayacan Mining Company, has been appointed manager of the company's mines and mill at Ocampo, Chihuahua, Mexico.

R. V. Norris, consulting engineer, of Wilkes-Barre, Penn., will begin next week the delivery of a course of lectures on coal mining to the students of the Lawrence Scientific School, of Harvard University.

Arthur W. Stevens, superintendent in charge of the Boise King Placers Company property, in Elmore county, Idaho, is at present visiting Chicago. He expects to return to the property in February.

Professor Rutherford, of McGill University, Montreal, has been appointed to succeed Professor Schuster as Langworthy professor and director of physical laboratories at Manchester university, England.

Robert K. Painter, who has recently been engaged in mining and exploration work, in Newfoundland, has accepted the position of general manager of the San Carlos Copper Company, at San Jose, Tamaulipas, Mexico.

Woolsey McA. Johnson, metallurgical engineer, of New York, returned last week from an extended trip through the West, where he has been engaged in connection with the smelting projects of the Tri-bullion Smelting and Development Company, which owns the Kelly mine, at Magdalena, New Mexico.

Norman Carmichael, who has been superintendent of the Arizona Copper Company's mines, and concentrators at Morenci for some time past, has been appointed assistant general manager of the company and second vice-president of the Arizona & New Mexico Railroad, with headquarters at Clifton, Arizona.

Alfred C. Sieboth has resigned as superintendent of the Lake Superior & Arizona Mining Company, Pinal county, Arizona, the resignation to be effective Feb. 1. Mr. Sieboth will again enter into the general mine-engineering practice, and has engaged to do some professional work in the States of Oaxaca and Vera Cruz, Mexico.

Prof. Robert H. Richards, of the Massachusetts Institute of Technology, Boston, Mass., is at work upon an appendix to his treatise on "Ore Dressing," which will be supplementary to the two volumes of that work already published, and will bring the work up to date. Professor Richards will be glad to receive information concerning new improvements in machines and mill plants.

H. W. Hardinge, mining engineer, of New York, returned last week from Cobalt, Ont., where he made an examination of the Nipissing property in behalf of the company. He then made another trip to Cobalt, from which he expected to return Jan. 7, then to proceed to Colorado, where he will be engaged for two or three weeks on professional business. Mr. Hardinge has taken an office at 43 Exchange place, New York.

Prof. William Gowland has been nominated to succeed Arthur C. Claudet, as president of the Institution of Mining and Metallurgy, and will assume office in March next. Professor Gowland has been head of the metallurgical department of the Royal School of Mines, South Kensington, since the death of Sir W. C. Roberts-Austen. In earlier days he was metallurgist to the Broughton Copper Company, Manchester, and to the Japanese mint. He is an old School of Mines man, having obtained the associateship in 1870. As a professor he is a great success, both personally and professionally.

Simon Guggenheim will be elected United States senator from Colorado. He was born at Philadelphia, Dec. 30, 1867, and was educated in the public schools of that city. In 1889 he went to the Philadelphia Smelting Works, at Pueblo, Colo., which was built by the Guggenheim Brothers, and since then has been largely identified with mining and smelting in Colorado. He is now a member of the executive committee of the American Smelting and Refining Company, and makes his headquarters at Denver. It has been stated in the papers that upon his election to the Senate, he will withdraw from active connection with the American Smelting and Refining Company.

Obituary

Frank C. Mandell, mining engineer, of Hailey, Idaho, died recently of pneumonia, after a brief illness.

Robert Ross Watt, president of the Watt Mining Car Company, Barnesville, Ohio, died Dec. 29, 1906, of tuberculosis, at the age of 46 years. He was born in the city where he died, and where he lived all his life. The business, of which he was head, was built up mainly by his exertions. He was well known and highly respected for his integrity and high standards as a manufacturer.

Winfield Scott Keyes died in San Francisco, Dec. 27. He was born in Brooklyn, N. Y., in 1839. He graduated from Yale college in 1860, and three years later from the School of Mines at Freiberg, Saxony. He was employed in California for several years, and about 1870 went to Eureka, Nev., where he was manager of the Eureka Consolidated mines. Some years later he was at Leadville, Colo., and was for several years in charge of the Crysolite mine there. During the Centennial Exposition at Philadelphia in 1876 he was a member of the board of judges. In 1878 he was honorary commissioner to the Paris Exposition. Mr. Keyes was an expert in many mining suits, and was a contributor to mining and scientific magazines. For 16 years he was chief of the California State Mining Bureau and a member of the executive committee of the California Miners' Association. He was vice-president of the Humboldt bank, and general manager of the Pan-American Development Company, operating mines in the State of Sinaloa, Mexico. Mr. Keyes was a member of the American Institute of Mining Engineers, National Geographical Society, and the California Miners' Association. Among his books are "Resources of California" and "Resources of Montana."

Societies and Technical Schools

American Institute of Mining Engineers—The secretary gives notice that all communications, etc., should hereafter be addressed to the Institute at "United Engineering Society Building, 29 West Thirty-ninth street, New York."

Montana Society of Engineers—The twentieth annual meeting will be held in Butte, Mont., Jan. 10, 11 and 12. The program includes visits to the Washoe Reduction Works, at Anaconda; visits to Butte mines, surface plants and the School of Mines; business meetings; reading papers and discussion; and a banquet.

American Institute of Social Service—Space is now being assigned for the exhibits of the first international exposition of safety devices, to be held at the American Museum of Natural History, New York, beginning Jan. 29, and continuing two weeks. The exhibits will include safety devices for wood and metal-working machinery; stamping, grinding and polishing machines; safeguards for boilers, elevators, windlasses, cranes and hoisting machinery; textiles and building trades; safety lamps and explosives; quarrying and agriculture; chemical industries, safety from fire; railway and trolley safety. All those wishing to exhibit safety devices in any of the above classes should apply at once to W. H. Tolman, director, 287 Fourth avenue, New York, for space. As the object of this exposition is to awaken the American public to the necessity of doing something to lessen the causes of accidents to American life and labor by means of a permanent museum of safety devices, where all problems of safe-guarding life and limb can be studied in their working details, there will be no charge for space.

Industrial

Among recent contracts received by the Crocker-Wheeler Company, Ampere, N. J., are large engines and generators for the Interstate Iron and Steel Company, Chicago, and for the Republic Iron and Steel Company's plant at Youngstown, Ohio.

Recent orders received by the Buffalo Forge Company, Buffalo, N. Y., include two 160-in. pulley fans for the mill of the Utah Copper Company, Garfield, Utah; a two-stage centrifugal pump for the Canadian Copper Company, Copper Cliff, Ont., and several large export orders.

The Utah Mining Machinery and Supply Company, Salt Lake City, has secured an order for twelve 24-in. belt duplex Callow screens and 140 eight-foot Callow tanks for the new concentrator of the Nevada Consolidated Copper Company at Ely, Nev. This is in addition to a large order previously placed.

G. & O. Braniff & Co., agents in Mexico City for the Westinghouse Electric Company, have received orders from the Moravillas y Anexas Mining Company, of Pachuca, for an electric double-drum hoist, of the J. G. Leyner Engineering Works, Littleton, Colo., connected to 225-h.p. Westinghouse motor, on a 2000-volt, 50-cycle circuit; and from the Castillo Hacienda, Jalisco, for two centrifugal pumps, operated by 100-h.p. Westinghouse motors from a 200-kw. generator of 2200 volts at the Juanacatlan power-house of La Electra, near Guadalajara.

Trade Catalogs

Receipt is acknowledged of the following trade catalogs and circulars:

Witte Iron Works Company, Kansas City, Mo. Witte Engines. Pp. 40, illustrated; paper, 6x9 in.; 1906.

Morris Machine Works, Baldwinsville, N. Y. Centrifugal Pumping Machinery. Pp. 90, illustrated; indexed, paper, 6x9 in.; 1906.

Ekert High Resistance Materials Company, Dayton, O. Ekert High Resistance Elastic Materials. Pp. 10, illustrated; paper, 5x7 in.

The Crown Drilling Machine Company, Akron, O. Catalog C. Crown Well Drilling Machinery. Pp. 63, illustrated; paper, 7x10 in.; 1906-7.

General Electric Company, Schenectady, N. Y. Bulletin No. 4468, Electric Mine Locomotives. Pp. 62, illustrated; paper, 8x10½ in.; November, 1906.

Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1503. Allis-Chalmers Direct-Connected Reynolds-Corliss Engines. Pp. 12, illustrated; paper, 8x10½ in.; September, 1906.

Hendryx Electro-Cyanide Company, Denver, Colo. Catalog No. 3. Descriptive of Apparatus for Cyaniding of Gold and Silver Ores and the Treatment of Copper Ores. Pp. 21, illustrated; paper, 5x8½ in.; 1906.

Construction News

Gold Butte, Nevada—The Nevada Gold Butte Mines Company is preparing to build a mill, and will soon be in the market for machinery. A. B. Greeson, Atlas block, Salt Lake City, Utah, is secretary.

Kendall, Montana—The Barnes-King Development Company will be in the market for all kinds of equipment, including rolls, crushers, belt conveyors, elevators and mechanical distributors of all kinds; electric hoists, machine drills, mine and mill equipment generally, cyanide equipment and supplies. Manufacturers and houses interested in this class of equipment are requested to send catalogs and lists to the mine office, at Kendall, Montana.

Carman, Manitoba—The Commercial Cement Company is making active preparations to begin the manufacture of cement at Carman, about 70 miles southwest of Winnipeg. A side track has been constructed connecting the company's plant with the main line of the Canadian Northern Railway. The works, including the factory proper, power-house and chemical laboratories, are approaching completion, and a quantity of the heavy machinery is on the ground. A large volume of water is supplied from a spring on the hillside above the works. The rock supplying the raw material is also procured at a considerable hight above the mill, and is transported through the various processes almost entirely by gravitation. Manufacturing will be begun in the early spring. The company, the head office of which is in Winnipeg, has $150,000 capital, N. P. Alsip, of that city, being president, and Otto Babcock, general manager and secretary-treasurer.

Special Correspondence

San Francisco Jan. 1

Fred H. Hazard, of the Oriental Reduction Works, of Portland, Oregon, is making an examination of the ocean beach black sands of Humboldt and Del Norte counties, Cal., and also of the placers of the interior where black sands occur. This company now owns the magnetic separation plant established at Portland, Oregon, during the Fair by Dr. D. T. Day, on behalf of the Geological Survey. The company is building a smelter and other reduction works at Portland, where it will handle their black sands.

There seems to be no diminution of the rush to the Greenwater and other copper camps of Inyo county and considerable development work is being carried on. All classes of labor are in demand. Freight teams are hauling in supplies and machinery in large quantities. An important consolidation of several of the principal copper properties in Greenwater is projected.

Good gold and copper prospects are drawing the attention of desert miners to the region about Silver Lake, in San Bernardino county, and a tent town of about 200 men has grown up there within the past four months. Silver Lake is a station on the Tonopah & Tidewater, about 30 miles north of Ludlow. Beeson and Newlin, the original locators, have claims showing streaks of ore carrying high gold values and copper, which they are developing, but the size of the veins has not been determined. Silver Lake appears to be on the southern extension of the copper belt in which Greenwater is located. There is plenty of good water in the camp.

After spending a great deal of money in Colusa county drilling for oil a few years ago, the principal operators gave it up as a bad job. Oil in paying quantities was not found. The failure of others, however, did not seem to dampen the ardor of the Williams Oil Company, of Colusa. When the oil boom was at its hight it started a well on the Brim place and another at Van Gilts. Both of these were failures, and the work was abandoned. At the present time the company is boring the third well near the Mountain House. New leases in the vicinity of the present well are being secured and recorded.

Word comes from New York, that the directors of the Balaklala Copper Company, of Shasta county, are planning to double the capacity of its smelter under construction at Coram, making it of 2000 tons capacity instead of 1000. In order to provide the necessary funds for this enlargement the company contemplates issuing bonds for $3,500,000, taking up the $1,500,000 bonds now outstanding and leaving a margin of $2,000,000 for improvements.

The Trinity River Mining Company, operating four miles above Lewiston, Trinity county, in carrying out its project of turning the Trinity river from its bed to get at the auriferous gravel, had to tunnel through a rocky point across a horseshoe bend. In driving this tunnel, which is now almost 500 ft. long, the company struck quartz carrying values in gold. The working force has been withdrawn from the tunnel so as to build a quartz mill to work the ore encountered unexpectedly.

The new electric line from Kennett, Shasta county, to the Holt & Gregg lime quarry has been completed. Since the introduction of smelting in Shasta county, well-located limestone quarries have become valuable, because of the necessity of a flux. At present the Holt & Gregg company furnishes daily to the Kennett smelter about 100 tons of limestone, while it delivers to the calcining works and to the railroad station for shipment to other points almost twice that quantity.

The famous Harrison Gulch townsite case, after years of litigation, has been decided by the Commissioner of the General Land office, who rejects the application of the townsite company for a patent. The decision involves the entire town of Harrison Gulch, Shasta county, which is thickly settled. It is held that the application for a townsite patent is invalid because the townsite was described by metes and bounds instead of by legal subdivisions. This is a point overlooked by all the lawyers who have been engaged on either side in the interminable litigation over the Bonanza claim and the townsite. The point was never raised in any of the innumerable trials in the Land Office and in the superior court. The department itself admits, too, that it was in error in not noting the fact when the application was first submitted to it, and then cites the section of the Revised Statutes. The decision is in no way a victory for E. P. Sherk, Andrew Fletcher and Frank Large, who claim a patent to the Bonanza mining ground, which is also wanted by the townsite people. That issue is still before the land office, although it has no legs to stand on until the townsite people make application anew, if they care to do so.

It is now expected that the independent oil producers of McKittrick, Sunset and Midway oilfields to the west of Bakersfield, Kern county, will organize to construct a pipe-line to Port Harford on the coast. The tide-water line will not be over 75 miles long.

It has been decided by the mine-owners and superintendents of Grass Valley, Nevada county, to give the men an eight-hour day from Jan. 1. This virtually means an increase of pay, as there will be three instead of two shifts daily. This will stop the talk of possible strikes.

Salt Lake City Jan. 1

The present output of the Utah coal mines is about 200 carloads a day, the bulk of which is consumed in the Salt Lake valley. In Salt Lake coal retails at $5.25 a ton.

Mine Inspector Thomas attributes the late coal famine in Utah principally to a scarcity of labor, while he does not exempt some of the transportation companies from blame on account of the lack of proper equipment. The report that a smelter will be built at Good Springs, Nev., by the Good Springs Consolidated Mining and Smelting Company of Los Angeles, has been revived. Salt Lake mining men are interested in seeing the project go through, as a good deal of Utah capital is invested in Good Springs mining property. Joseph Dederick, of Los Angeles, is president of the company.

It has been announced officially that the San Pedro, Los Angeles & Salt Lake Railroad Company will begin the construction of its branch line from Caliente to Pioche, Nev., a distance of about 30 miles, soon after the beginning of the new year. More mining activity is in evidence in the district than there has been for many years. An effort is being made to merge the properties owned by the Nevada-Utah Mines and Smelters and Ohio-Kentucky Mining Company. Samuel Newhouse, president of the latter named concern, is said to be taking the initiative in the matter.

The management of the Nevada Gold Butte Mines Company, with headquarters in Salt Lake, but operating at Gold Butte in the St. Thomas mining district in southeastern Nevada, has secured an option on some additional property. A. B. Greeson, Atlas block, Salt Lake, is secretary of the company.

The coal famine in Utah, although the situation is somewhat improved as to what it was several weeks ago, still handicaps mining operations in several camps. The districts along the route of the San Pedro, Los Angeles & Salt Lake Railroad appear to be worse off than those reached by other lines, which is due to the fact, no doubt, that the road penetrates no coal-mining districts, and is at the mercy of connecting lines. The Cactus mill, in Beaver county, was forced to close on account of a scarcity of fuel. The Consolidated Mercur company has been running on short tonnage, handling no sulphide ores which require roasting.

The business men of Murray and Bingham Junction, where the principal smelting operations of the Salt Lake valley are carried on at the present time, have awakened to the seriousness of the situation if the smelters move elsewhere, which they will be compelled to do if the injunction from Judge Marshall's court becomes effective. Meetings have been held and a petition is being circulated among the farmers of the valley, which is

to be presented to the court, asking for an easement, or modification, of the decree. In the meantime, however, the smelting companies are looking for other sites, and it is a certainty that the Utah Consolidated management will not change its plans to move out of the valley entirely.

Scranton Jan. 8

The sensation of the anthracite district this week was the announcement that the board members of District No. 1, of the United Mine Workers, with headquarters in Scranton, had decided to work without pay. This is due to the depleted condition of the treasury, there being no money with which to pay the salaries. The board members and organizers who make this sacrifice state that they will continue to do the work, without salary. Those who give up their salaries are Stephen J. Rea, Olyphant; J. P. Kearney, Archbald; M. S. Healy and Richard Rowlands, of Scranton; Thomas J. Llewelyn, Avoca; Frank Gonglefski, Forty Fort; William Carne, Wilkes-Barre, and Con Gallagher, Plymouth. The only officers in the district who will draw salaries are President T. D. Nicholls, Vice-President Adam Ryscavage and Secretary John T. Dempsey. Many of the locals are in arrears with their assessments, so that the district would have been in bankruptcy had the officers not taken this drastic course.

General Manager W. J. Richards, of the Philadelphia & Reading Coal and Iron Company, has authorized a statement in connection with the discussion on child-labor at the recent meeting of the Civic Federation in New York, in the course of which he states: "We have in Pennsylvania a mining law prohibiting the employment of boys under 16 years of age in the mines, and of boys under 14 years outside the mines. The operators took a prominent part in aiding the passage of that law, and have not in any way connived at its being broken. From my knowledge of the people of our mining community I am positive that they have not permitted their sons, who are under legal age, to work in the mines to any such extent as has been stated, or to any appreciable extent."

State official statistics, recently published, show that there are but two classes of labor in Pennsylvania as highly paid as the anthracite miner. Last year the anthracite miners received, on an average, $690.34 each. In 82 out of 84 industries cited and tabulated the average wages fell much lower than the above figures, and in 42 instances the employees received more than $200 less than the anthracite miner.

For the first time in its history the Delaware, Lackawanna & Western Railroad takes second place in the rank of the anthracite-producing companies, a place which for so many years was held by the Lehigh Valley Railroad, which this year falls into the third place. The production for the year was as follows in the northern basin: Delaware, Lackawanna & Western, 9,050,000 tons; Lehigh Valley, 8,500,000 tons; Delaware & Hudson, 5,401,398 tons; Erie, 5,760,000 tons; Ontario & Western, 2,500,000 tons; Temple Iron Company, 1,800,000 tons. The first place is still held by the Philadelphia & Reading company.

Toronto, Ont. Jan. 4

The tenders recently received for the mining rights to the bed of Kerr lake, Cobalt, with an area of 23 acres, having all been rejected as insufficient, the Ontario government called for fresh tenders which must be received by Jan. 9. The property is offered this time subject to a royalty of 10 per cent. on the gross value of the output, bidders being asked to name the additional cash bonus they are willing to give.

Paul Rasch and Louis Haas, two German prospectors, have arrived here from Larder lake with numerous samples of gold- and silver-bearing quartz.

Active operations in boring for oil are being carried on at Manitoulin island, Lake Huron, where about 100 wells have been put down at an average cost of $500 cash. It is claimed that operators in this field have an important advantage, owing to the small expense in well sinking. Attention is also being directed to St. Joseph's island in the neighborhood of the Sault Ste. Marie, as a probable oil-producing region, the formation being similar to that of Manitoulin. The Hickey Oil Company, of Detroit, which two years ago struck two or three gushers in the Leamington oilfield, has been wound up. The wells gave out and the receipts were insufficient to cover cost of construction and machinery, a deficit of $14,000 being left.

The first gypsum plaster made in Winnipeg has been turned out by the Manitoba Gypsum Company, at its works in that city. The raw material is brought from a large deposit of gypsum on Manitoba lake. The company had works in that neighborhood but they were destroyed by fire in July last, and the industry was transferred to Winnipeg. About 70 hands are employed.

London Dec. 29

A good deal of controversy has been raging lately among people interested in the shares of the San Francisco del Oro Mines, Ltd., an English company floated three years ago to acquire the silver-lead-zinc mines of that name, near Parral, Chihuahua. Your readers may remember that at the time of flotation I referred to this company, pointing out that, as zinc had appeared at depth, the local owners were pleased to get rid of it. I mentioned also that in the prospectus the directors gave as the value of the ore "in sight" the total market value of the separate metals and not the actual commercial value of the ore. During the last three years developments have proceeded and there are already blocked out very large bodies of ore averaging 26 oz. silver, 11 per cent. lead and 25 per cent. zinc. At deeper levels the ore is stated to run higher, 58 oz. silver, 20 per cent. lead, and 28 per cent. zinc. The discovery of this lower orebody was announced in England first by one of the daily financial papers, and not by the company; in fact the directors say they knew nothing of the discovery at the time. Shortly afterward the Paris edition of the *New York Herald* published a disparaging article on the mine. The directors have waxed indignant at this article and have made fun of "Yankee" journalism, but I would point out that laudatory articles in certain English financial papers have equally to be taken with a grain of salt.

During the time that the San Francisco del Oro has been worked by the English company, a considerable income has been made by picking out salable ore and shipping it to smelters. To what extent the ore shipped consisted of unexhausted carbonates from the upper levels and what consisted of sulphides cannot be said with certainty, but the total amount shipped was 50,000 tons up to the end of 1905, and the receipts from it were £120,000. The attention of the directors has always been keenly applied to the metallurgical treatment of this ore, and it is probable that they will decide before long on a system similar to that pursued at Broken Hill.

About a year ago I referred to the change in control of the Copiapo Copper Company (working in Chile) by which the direction of affairs was handed over from Henry Bath & Son and James & Shakespeare to a board consisting of nominees of the Siemens group. For some years the company had only been jogging along, and the chief shareholders desired to try their luck by making a change. The new board has now been in charge long enough to grasp the situation and to decide on a new course of policy. Hitherto the ore has been hand-picked up to 16 per cent., and shipped either to England or to smelters on the coast. It is now intended to erect smelters on the spot, and ship the matte. In this way the dumps of low-grade ore will also become available. It has been necessary to write down the assets drastically, and bring the reserve fund into current account. The subscription of new capital for the smelters will also have to be considered before long. Many of the shareholders are rather sad because under the new régime their immediate prospects of a dividend are apparently as far off as ever. It must be remembered that the company has been in operation seventy years, and has paid large dividends in its time; but during the last 15 years the profits have been small, and nothing has been distributed since 1902. There are still very large quantities of ore.

General Mining News

ARIZONA

YAVAPAI COUNTY

New Engineering Company—E. A. Haggot, J. B. Giraud and K. B. Smith, of Prescott, have associated themselves in a corporation to be known as the Haggot-Giraud-Smith Company, the purpose of which is to do a general mining and civil engineering business. The new company is now equipping offices and laboratories for its use.

Buffalo-Arizona Mining Company—This company has let a contract to the Phœnix Iron Works for the erection of a five-stamp mill; also some other necessary machinery to be used in connection with the mill.

H. J. Beemer Company—This company reports a new strike at its mines, south of Prescott. The Ten Spot Ledge was cut at the depth of 298 ft., where it is found to be 5 ft. in width, with good values all the way across.

Gold King Mining Company—This company has developed a large body of sulphide ore, the chief value of which is copper. Its mines are in the Bradshaw mountains, 25 miles south of Prescott. It had been thought that this mine would prove to be a gold mine, but the latest developments tend to prove that it is distinctly a copper proposition.

ARKANSAS

A large number of the Arkansas mines are idle, because the miners refuse to work under the screened-coal agreement entered into between the operators and miners at the close of the strike last summer. They claim that it is a violation of the Arkansas mine-run law. The officers of the union have ordered the men to continue at work, but they refuse to do so.

CALIFORNIA

AMADOR COUNTY

Irish—This old copper mine is about to be reopened. The property was sold for $65,000 a few weeks prior to the confirming of the grant title to the land where the mine is situated.

Gold Ridge Mining Company—This company has been organized to acquire and operate the old Defender mine in Pioneer district. The directors are F. B. Joyce, E. E. Endicott, R. Ousby, B. C. Austin and G. W. Brown.

Water Supply—All the mines on the Mother Lode in Amador county were compelled to close down for a few days for lack of water, but the storms brought a supply quickly and there will be no more trouble of that kind for many months.

EL DORADO COUNTY

Standard Unit — At this mine, near Greenwood, Samuel Beese, superintendent, work is being pushed on the lower tunnel and the mill has been started up.

Vivian — A five-stamp mill has been brought to this mine at Greenwood. If the mill tests on the ore are satisfactory, more stamps will be provided.

Danube—This company is working the French Hill mine near Greenwood and is sacking the concentrates until the cyanide plant is completed.

Cranes Gulch—This old mine, near Georgetown, yielded an $8000 pocket last week, one of the pieces weighing $850. It is owned by J. W. Morgan, V. Fornia and Fred Smeeder.

MADERA COUNTY

Copper—In the mine owned by Captain Van Simmons, at Buchanan, a 2-ft. ledge of high-grade copper ore has been found.

Discovery — Frickstadt & Nemo have located four claims near Raymond and in one of them a 4-ft. ledge showing free gold has been found.

MONO COUNTY

Masonic District—New companies are being formed in Nevada county to take over claims in this district. The Masonic Investment Company has taken over the Oro Grande, Golden Mammoth, South Side and Emporium. The Caliverde Mining and Milling Company, another Nevada corporation, has purchased the Golden Reef and Golden Crown. The Myrtle, Julia and Valley View claims are also about to be incorporated as one company. The Masonic Mining Company is doing extensive work on the True Friend claim.

NEVADA COUNTY

Keller—This mine, near Graniteville, has been purchased by T. A. Garbutt, of Los Angeles, and T. Torpie, of Nevada City, who will extend the 500-ft. tunnel to 1500 ft. The mine is rich in spots, but dependence is laid on a wide ledge of low-grade ore.

Murchie Mining Company—Wm. J. Organ has obtained a two-year lease from this company on a ledge on which he first worked over 30 years ago.

Boss—This mine, near Sweetland, has been bonded by the same San Francisco men who own the Golden Eagle mine in Lassen county. Edward H. Benjamin is the manager and J. H. Collier, superintendent. The mine was formerly worked for gold, but will now be exploited mainly for copper.

Pennsylvania Mining Company—This company has ordered two of the largest size pumps to be placed on the W. Y. O. D. mine, thus showing that the bottom workings of that mine are to be operated. The pumps are of Cornish type, 18 in. in diameter and 8 ft. stroke, the capacity being 600 gal. a minute.

Le Compton—This old mine, in Deer Creek, near Nevada City, formerly owned by Senator George Hearst, is about to be reopened. The mine has pumps, hoist and mill, and the shaft, now 500 ft. deep, is to be sunk several hundred feet deeper.

PLACER COUNTY

Hathaway—At this mine, Ophir, A. B. Eastwood, superintendent, the foundation for the new plant has been laid and the compressor is on the ground.

PLUMAS COUNTY

Mountain Meadows Copper Company—This new company owns property in Lights cañon, Plumas county, as well as in Mountain Meadows district, Lassen county. Both are to be developed.

Plumas-Eureka—The new mill at this old mine, Johnsville, is completed. The starting up of this mine after several years of idleness has stimulated mining throughout the district.

SAN BERNARDINO COUNTY

Colorado River & Ely Copper Company—This corporation has bought from J. L. Carden, of Los Angeles, the Desert Light and Big Foot copper groups, four miles from Klinefelder. They are copper properties and among the promising ones of the desert region.

Orange Blossom—From this mine, 14 miles from Bengal station on the Santa Fe line, the first 52 tons of ore taken out yielded $3000. Fifteen men are at work. The mine is owned by Seburn Brothers.

Goldbend District—In this new district, southwest of Needles, a number of veins have been discovered, notably the Gold Dollar group, now taken over by the California Hills Mining Company. There is a road from the camp to the smelter at Needles.

SANTA BARBARA COUNTY

Santa Maria Oil and Gas Company—The new oil well No. 5 in the Santa Maria field is now spouting 2500 bbl. of oil daily, but embankments had been made and no oil was lost. It is one mile south of the famous Hartwell No. 1 well. The land belongs to the Union Oil Company, of California.

TRINITY COUNTY

Quimby Mining Company—There has been some dissension among the stockholders, but as soon as this is settled work will be prosecuted vigorously. Superintendent J. A. Brent is running the 400-ft. tunnel on the lower level.

TUOLUMNE COUNTY

Santa Ysabel—E. C. Loftus, of Groveland, now in New York, has secured capital to continue work on this mine and will sink the shaft to the 1500 level.

COLORADO

BOULDER COUNTY

Modoc—This property in the Ward district, after an idleness of 11 years, is to be reopened again, the mill is to be remodeled and heavy machinery will be installed. Property is located at Ward.

New Mill—The 500-ton Langridge mill located on South Boulder creek is nearing completion, and will treat ore from a big dike of outcroppings reported to be over

120 ft. wide, and carrying values of from $3 to $5 per ton.

CLEAR CREEK COUNTY

Gem Consolidated—The property of this company, near Idaho Springs, has been sold to a syndicate of Pennsylvania and New York capitalists, the reported consideration being $2,000,000. The property has been and will be worked extensively through the Newhouse tunnel and the plans of the new company include the erection of a concentration plant of from 500 to 1000 tons capacity at the mouth of the tunnel to treat the ores from the Gem properties as well as to do a large custom business. W. E. Renshaw, Idaho Springs, Colo., will be manager and the new officers include J. H. Galey, Pittsburg, Penn., president, W. E. Renshaw, Idaho Springs, Colo., vice-president, J. E. Watson, Pittsburg, secretary and treasurer.

Calla—This property, in the Peruvian district, has been leased and bonded to Denver people, with Otto Haussing of Idaho Springs, Colo., in charge and it is reported that they will erect a small concentrating plant.

LAKE COUNTY—LEADVILLE

Hoffer Shaft—Much interest is being manifested by local mining operators in the deepening of the old Hoffer shaft, and many of them predict that if the project discloses any big body of ore it will mean the indefinite extension of the Leadville mining district to the north. There was a time when the old-timers thought that the orebodies such as those contained on Carbonate hills were restricted to a certain area and did not extend to the north. This theory has been exploded, however, for in 1891 a drill hole was put down on the Hoffer which showed conclusively that the same geological conditions that prevailed on Carbonate and Fryer hills obtained as far north as the Hoffer at any rate. The Hoffer, or rather the Bob Ingersoll, property was staked off in the early days of the Fryer hill excitement and the claims have had a varying experience since that time. Only the required amount of assessment work was done on the Ingersoll for several years; the Hoffer shaft not being started until 1880. The starting of the shaft at that time caused considerable excitement, and many of the knowing ones pronounced the claim to be in the proper location to be worth working. The work on the Hoffer went ahead rapidly until water was encountered, after which the work of development went on more slowly. The water problem was a new one at that time to the Leadville district, and everything now known about battling with this enemy was yet to be learned. Up to the year 1882 the heaviest outlay made in the entire district for the handling of the water was made by Mr. Hoffer. At that time he had installed four Cornish lift pumps with a capacity of 350 gal. per minute. Later a No. 9 Cameron was installed with a capacity of 250 gal. per minute. This plant was entirely inadequate to the handling of the water, however. Intermittent work has been kept up since that time, but little progress has been made in sinking the shaft. Now, however, Mr. Hoffer has interested Eastern capital and work has been started on an extensive scale. The Midas pumps have so drained the Ingersoll group that work can be carried on without putting in any big pumping plant. Recently two remarkably good bunches of ore have been encountered, but they were not followed up, as Mr. Hoffer is determined to push the shaft down to the Cambrian quartzite, believing that there he will encounter the same big bodies of ore that are found in that formation in the Coronado.

Weston Pass Section—This is a locality which was more talked of in the freighting days than it is at the present time. Mining operations have been carried on here for more than 20 years but with varying success, for the distance from Leadville, the long haul and the bad roads have made costs almost prohibitive. The best and most promising mine in this district is the Ruby, which has been operated since last October. The Ruby lies on both slopes of the range, being both in Park and Lake counties. The apex of a large vein can be traced the entire length of the claim in an easterly and westerly direction, the outcrop showing every few yards. The development work consists of a tunnel and an incline. The breast of the tunnel is all in ore, now being taken out, and of values that will pay a profit. There are several more good properties in the Weston Pass section and if the roads can be improved this will prove a good camp.

Rock Hill—A fine body of sand carbonates running high in values and accompanied by a large vein of galena has been encountered in the Sequin over on Rock hill. The Sequin lies a few hundred feet to the west of the Bessie Wilgus, on Rock hill, both properties being operated for some time by C. B. Wilgus. The Sequin has been a regular shipper for several months past, as has also the Bessie Wilgus, but the last strike makes it prominent. A contract has been let for the deepening of the Bessie Wilgus 300 ft., which will carry the shaft down to 800 ft. depth.

SUMMIT COUNTY

The total value of the mineral output for Summit county for the year 1906 is as follows: Gold, placers and dredges, $152,600; stamp mills, $50,000; smelting ore and concentrates, $100,401; nuggets and specimens, $5000; total gold, $306,001. Silver, ores and concentrates, $289,400. Lead, ores and concentrates, $140,290. Zinc, ores and concentrates, $197,197. Iron, ores used for fluxing, $20,000. Copper ore, $8023. The total value being $963,631, which is over $100,000 increase above 1905. With the outlook at present it bids fair to be doubled during 1907.

With the increase in the number of producing mines added to the list, Summit county is beginning to receive some of the attention which it has long deserved; and with its mines of gold, silver-lead, zinc, iron, copper and bismuth, its bountiful water supply, its abundance of timber and other natural advantages, combined with its accessibility, is now attracting the notice of experienced mining men, as well as of the Eastern capitalist. The consolidation of holdings and interests is an important feature of the past year, and there are now on the tapis a few new consolidations being considered.

Jessie—New incorporations for 1907 are to be looked for and this month gives a good starter with the Jessie Gold Mines Company. This company has been organized by James T. Hogan, after working the Jessie mines and mill on a bond and lease for over a year. The Jessie, Diana and Florence groups, which comprise in all about 500 acres, are consolidated in the organization, which is incorporated for $1,500,000, in 1,500,000 shares of $1 each. The property has been favorably reported on by David H. Lawrance, of Denver, and the process of cyanide treatment worked out by Mr. Knappe, of Denver. It is the intention of the new management to install a mill of 400 or 500 tons daily capacity, with a cyanide plant for treating the tailings.

TELLER COUNTY—CRIPPLE CREEK

The past year in this district has been one of considerable activity in mining While there has been no particular boom during the year, a large amount of ore has been shipped both on company account and by lessees. It is now an absolute certainty that the drainage tunnel will be put through. Just which one will be chosen has not yet been decided, but it is thought that it will be the intermediate one known as the Gatch Park project. This is somewhat shallower than the longer or Window-in-the-Rock. The executive committee will meet in a few days to decide definitely which one will be chosen.

Ore-Treatment Rates—The announcement a few days ago of a very low rate of treatment of the low-grade ores by the United States Reduction and Refining Company is good news to ore shippers. Just how long the new rates will last is not known. The Golden Cycle mill, at Colorado City, is about ready to run, and a number of contracts have been made with the mine owners for ore. It is the advent of this mill that has given rise to very low rates by its competitor. No contracts, however, have been made on the basis of this low rate.

Acacia—This company recently held its annual meeting, and the same directors as last year were elected. The reports of the officers of the company show its affairs to be in very good shape. Considerable money has been received in royalties during the past six months from the lease of

the South Burns, which is being operated by the Standard company.

Work—The Little Clara lease, on the Work property, which has been such a wonderful producer, still continues to put out a large amount of ore.

Rhyolite Mountain—One of the important recent developments has been the discovery of good ore on the property of the Western Union, on Rhyolite mountain, which lies north of the town of Cripple Creek. Heretofore no ore of any great value has been found on this hill.

INDIAN TERRITORY

CHOCTAW NATION

On Dec. 18 a serious gas explosion occurred in the Degnan-McConnell Coal and Coke Company's slope mine No. 19, at Wilburton. The tipple was badly damaged, but no one has been able as yet to find out how much damage was done in the mine. About a month ago a serious explosion occurred in the same mine, setting it on fire inside in such a way that it was impossible to get at the fire to extinguish it. Water was run in till it was thought the fire was all submerged, and then the mine was closed up. The coal pitches there about 20 deg., and it would seem that the fire was not entirely covered with water, for when it was opened, on Dec. 18, and before anyone had entered it, when sufficient air had mixed with the accumulated gas to form an explosive mixture, the fire evidently set it off.

MISSOURI

ST. FRANCOIS COUNTY

Increase in Wages—The St. Joe, Doe Run and Desloge companies have raised the wages of the underground men about 8 per cent., to take effect at once.

Columbia Lead Company—The lands of this company have been optioned until April 30, 1907, to the Doe Run Lead Company for $660,000, of which $12,000 is cash, with interest at the rate of 6 per cent. on the purchase price.

Doe Run—The old No. 1 mine at Flat river, that has been drowned out for years, is to be recovered by unwatering it through a drift to be driven from No. 4 mine.

Mine la Motte—The negro labor that has been employed since the slavery period in mining, smelting and tributing has been discontinued, and the negroes have been ordered to vacate the company's houses.

MONTANA

BUTTE DISTRICT

North Butte—This company has cut a 16-ft. vein of first-class ore by a crosscut from the 1600-ft. level of the Jessie, in Gem ground, making four veins from which it can secure ore, the Speculator, Edith May, Jessie and Gem. The opening is going north to tap the vein of the Berlin. The company is maintaining its output of 1200 tons of ore a day, but like other companies has difficulty in securing cars for transporting the product to the smelter.

Anaconda—The shaft on the High Ore has reached a depth of 2600 ft., the deepest in the district, and a station is cutting at the bottom. Drifting on the vein at the 2400, which was stopped some time ago, has been resumed. The 2400 and 2600 levels will be connected by raise and winze. Operations in the Anaconda mine will be resumed early in January. Work in it was stopped Nov. 23 to permit of repairs in the shaft, and while it could have been resumed at any time the company decided not to start until the car-shortage condition could be partly overcome. Crosscutting for the vein at the 2400 of the Neversweat, which was also suspended several weeks ago, has been resumed, but two months will elapse before the vein is cut.

Reins Copper—There are 10 ft. of copper ore on the 1000-ft. level, 4 ft. of which is almost solid glance, the remainder being a mixture of glance and quartz. J. P. Reins, former president of the company, says the company netted $10,000 during December, and could have earned double the amount, had it been able to ship its ore. Mining is in progress on the 800-, 900- and 1000-ft. levels, and the vein will soon be opened on the 1100.

Original—This company is sinking in the barren zone, and is depending upon the upper levels for its supply of ore. It expects to penetrate the zone in a few weeks. As a result of ore shortage from its own mines, it has entered the open market with bids for ore, and is securing enough to keep its plant in operation most of the time, barring the concentrator, which is often down for a day or two at a time.

Boston & Montana—This company will equip the Leonard mine with the electric haulage system first, but will not be ready for the engines until April. The system will be installed on the 800-, 1100- and 1400-ft. levels, in which 17 horses are now used. The company is shipping only 3000 tons of ore a day to its plant.

Butte & Bacorn—This company has cut a 35-ft. vein south of the 500-ft. station of its Calumet claim and a 17-ft. vein north of the same station. Neither vein carries commercial ore, but both are highly mineralized. In the opinion of the company, greater depth is necessary. This company is backed by 40 Pittsburg men, each of whom contributed $10,000 to the original development and equipment fund.

Bullwhacker—The lease on a portion of this property expired Dec. 31, with about 150 tons of 5½ per cent. copper ore on the dump. The estimated earnings of the lessees for December were $67,500. The company will work the mine hereafter.

NEVADA

NYE COUNTY—TONOPAH

Ore Shipments in 1906—According to the official returns of the Tonopah mining companies, 121,375 tons of gold and silver ore were shipped to the smelters in 1906, and the returns netted $2,200,000. The producing mines were as follows: Tonopah, 67,000 tons of ore, yielding dividends amounting to $1,200,000; Extension, 27,500 tons; Belmont, 15,350 tons, yielding $800,000 in dividends; Montana, 4650 tons; Midway, 4000 tons, yielding $200,000; West End, 1000 tons; MacNamara, 750 tons; North Star, 650 tons; Jim Butler, 200 tons; smaller mines, 275 tons. All the above mines have large ore reserves, and as the newly erected mill of the Tonopah Mining Company is now working and other reduction works are in process of construction, there will be better facilities in the near future for treating the ore. This will lead to a largely increased production.

Unsatisfactory transportation facilities and inadequate reduction mills are the chief causes in limiting the rapid expansion of this great camp. It is possible that, with its new mills operating to their full capacities of 650 tons per day, the Tonopah Mining Company will be able to declare larger dividends. The Belmont, Midway and North Star should be great yielders in the near future. They all have large bodies of high-grade ore blocked out awaiting crushing facilities.

NYE COUNTY—MANHATTAN

Manhattan Consolidated Extension—A drift run out from the 44-ft. level a distance of 175 ft. has cut a ledge of high-grade ore. About 10,000 tons of ore are blocked out, which are estimated to run from $20 to $50 per ton. The showings in other parts of the mine are also promising and the directors of the company, after a recent inspection of the mine, determined to arrange for the erection of a mill immediately.

Broncho—The ledge in the 100-ft. level is 8 ft. in width and averages $75 per ton. The vein matter is a calcareous quartz carrying sulphides. A crosscut is being run with all speed from the 200-ft. level to cut the ledge at depth.

Copper Belt-Bonanza—The shaft of this East Manhattan copper mine is down 130 ft. A good orebody is being developed, which averages 8 per cent. copper. Several of the adjoining mines are developing the ledge.

Manhattan Mammoth—The tunnel has been driven a distance of 475 ft. and it is estimated that it will require to be continued 40 ft. farther before intersecting the vein. Surface prospecting is being continued with satisfactory results, several quartz bodies streaked with copper and gold having been found.

Pine Hill—Work has been resumed on this property and the shaft will be sunk

on the ledge to a depth of 200 ft. Gold values are improving with the sinking and the owners believe that they are approaching a body of pay ore, as the vein is becoming more compact and more highly mineralized.

NYE COUNTY—JOHNNIE

Johnnie Consolidated—The ledge in the 700-ft. level is showing up better than ever before. It is 18 ft. in width and assays over $20 per ton.

Globe—The vein in the main tunnel is improving in size and value. It is between 3 and 5 ft. in width and assays from $30 to $50 per ton.

Johnnie Gold and Copper—This mine has recently changed ownership and the new company, in which J. Ross Clark is a prominent director, is putting on a number of men with the view of rushing development work. The prospects of the mine are good.

NYE COUNTY—BULLFROG

North Star—A 5-ft. ledge has been cut in the main working tunnel in Ladd mountain. It is composed of a bluish, manganese-stained quartz resembling that occurring in the Hobo.

Gibraltar—Development work is progressing rapidly. Large ore reserves have been blocked out and some of the richer ore is being sacked for shipment to the smelters. J. H. Shockley, of New York, the company's consulting engineer, is engaged in designing a milling plant of a capacity of 200 tons daily, which will be erected as soon as possible.

Mayflower Consolidated—The shaft has been sunk to a depth of 240 ft. and is in excellent ore. The gallows frame has arrived and the new gasolene hoist is on the way from Tonopah. As soon as they are placed in position development work will be carried on vigorously in all parts of the mine.

Golden Sceptre—A new prospecting shaft has been started on the Hobo vein and work is proceeding steadily in the main shaft and tunnel. The prospects are improving and a larger force of men will soon be put on.

Shoshone—The litigation which has delayed work on this great property has been ended in a manner satisfactory to Chas. M. Schwab, the principal owner, and mining will now be resumed on a larger scale.

NEW MEXICO

SANTA FE COUNTY

San Pedro District—The stimulation of the high price for copper has at last reached San Pedro. The Santa Fe Copper Company is reopening its mine and is hiring all the men that apply, in order to get affairs in shape to start up its smelter as soon as possible. This company is controlled by Amalgamated interests and, like many other mines in the district contains large quantities of 6 per cent. copper oxides and sulphides. Some years ago the camp exhausted its high-grade 10 to 20 per cent. copper ores, and it is only the 20c. price for copper that has rendered feasible the smelting of the 6 per cent. ores with their silicious gangue. The orebodies resemble those of Kelly in being flat lenses in stratified limestone, but their value is in copper instead of zinc.

PENNSYLVANIA

ANTHRACITE COAL

Philadelphia & Reading Coal and Iron—This company's report for November and the five months of its fiscal year from July 1 to Nov. 30 is as follows:

	November.	Five Mos.
Earnings	$3,781,537	$14 024,019
Expenses	3,543,174	13,475,314
Net earnings	$ 238,363	$ 548,705

For the five months there were decreases of $654,242 in earnings; of $272,440 in expenses, and of $381,802 in net earnings.

Enterprise Colliery—The fire in the Enterprise mine, Shamokin, which was partly extinguished after an unusually long and stubborn fight, cost the proprietors $275,000. The fire is still burning in one part of the old workings, but this will not interfere with the operation of the colliery. This fire will go down in history as the most expensive fire in the anthracite region, and the above amount represents the actual cost of extinguishing the fire alone, without regard to the loss sustained by the mine being idle.

Oxford Colliery—The men and boys employed in the Oxford colliery, of the People's Coal Company, in Scranton, received New Year's gifts amounting to about $20,000 from the company, this making the fifth annual distribution of the gifts, ranging about the same amount annually. One or two of the miners earned, including the gifts, in the neighborhood of $2000 during the year. The gifts were based on the earnings and length of service.

Pennsylvania Colliery—Although about 1000 gal. of water a minute are being poured into the burning portion of No. 9 mine of the Pennsylvania colliery, in Pittston, the fire seems to be unabated. Two bore-holes have been sunk into the workings and powerful streams run through these day and night. The gangways leading to the burning section have been closed up airtight with thick brick walls and the entire mine is to be flooded. This work will take several weeks.

SOUTH DAKOTA

CUSTER COUNTY

Clara Belle—This company, at Oreville, has discontinued work, excepting that which is necessary to keep the water out of the mine and keep the pipes, etc., from freezing, until further survey can be made. This is now being completed and the work will be resumed soon, probably early in January. The shaft has a depth of 265 ft. and the drifting about 240 ft. in all.

Lillian Belle—This company has sold its seven mining claims to R. G. Gillespie, of Pittsburg, for $7500, with a cash payment of $500 down and the balance in three months. The main vein is about 25 ft. wide and composed of quartz, mineralized slate and iron oxide. Work will be pushed on this and the Granite Reef adjoining it, with a view to consolidating and erecting a reduction plant.

LAWRENCE COUNTY

Echo—A special stockholders' meeting was held in Deadwood and it was voted to increase the capital stock from $300,000 to $800,000. The company has been working about three years and in preliminary exploration has cut several veins, all near the apex. Plans are now made for deep mining and sufficient equipment in the way of hoist, engines, air compressor and drills.

Minnesota—The foundations and grading for the new mill building are completed. The work of frame construction is now going on. The mill will be 154x127 ft. and will be a wet cyanide plant of 200 tons.

Homestake—Richard Blackstone, chief engineer; B. C. Yates, assistant engineer; J. A. Spargo, master mechanic, and W. S. O'Brien, foreman, have left for a trip through different mining sections to look into the matter of putting in skips in the mine in place of cages. This change is under consideration and if the committee reports that this will be more practical and economical, it will be done at once.

Hidden Fortune—The sale set for Dec. 15 was again postponed for 45 days. All parties agreed to this when they learned of H. J. Mayham's plan to save the property. He is sending out men to visit all Columbus and Hidden Fortune stockholders for the purpose of disposing of the bonds of the new company. He thus hopes to take up the judgment of the Colorado Iron Works Company, the company's principal creditor.

Dakota—The management is considering whether to move the mill from Deadwood to Bald Mountain, or to increase its capacity. Under present conditions it is not paying well. The average value of the ore is $6, but in breaking with drills the barren or low-grade ore is mixed in, reducing the values to about $4. Freight rates to Deadwood are about 50c. a ton, in addition to moisture charged for. The capacity of the mill is only 100 tons.

PENNINGTON COUNTY

Castle Creek—A Colorado company has bought 400 acres of ground on Castle creek and will build a hydraulic plant of a capacity of 2000 cu.yd. of gravel per day. A ditch and flume three miles long, with a pipe line 42 in. diameter, will be built.

The ground lies along Castle creek for a distance of about seven miles.

TEXAS

BREWSTER COUNTY

Chisos Mining Company—This quicksilver company, of Terlingua, intends to erect a new furnace of about 20 tons daily capacity in the near future. At present the company has to haul its ore a distance of three miles to a leased furnace.

UTAH

BEAVER COUNTY

Cedar Mining Company—The management will soon place an order for a large gasolene hoist. Developments of late have been of such an encouraging nature that it is the intention to sink the shaft deeper.

Commonwealth Mines Company — This is a new organization, of which Newton Dunyon is president. It owns property in Beaver county, near the Talisman mine. Plans are being laid for a vigorous campaign of development.

Blue Bird Copper Company — Eastern parties have become extensively interested in this property and development will be resumed under the management of G. D. B. Turner, of Salt Lake.

SALT LAKE COUNTY

Copper Glance—This company has recently been reorganized, with B. F. Grant, president; F. R. Snow, secretary—who, with J. E. Edmunds, W. P. Davis, L. H. Gray, L. A. Marks and R. E. Miller, constitute the board of directors. The capital stock of the company is to be increased to 1,000,000 shares. The company's property is in Bingham.

Bingham Standard — Officials of this company report an important ore discovery at a point 500 ft. in the tunnel, assays showing 50 per cent. lead, 5 per cent. copper and $1.60 in gold.

TOOELE COUNTY

St. George Copper Company—Explorations are being made on the contact on the 250-ft. level.

New Stockton—This company, operating in the Stockton district, has recently placed a large block of treasury stock, from which it will derive a fund of $150,000 with which to carry on further development. During the past year some large bodies of low-grade ore were opened. It is anticipated that, with the shaft down another hundred feet, there will be a change for the better, as the present lowest workings of the mine are just on the edge of the sulphide ore zone.

WISCONSIN

ZINC DISTRICT

Hibernia — One of the most important announcements of concentrating-plant construction that has been made in the Platteville district for some time was made a week ago when the Hibernia interest awarded a contract to the Galena Iron Works for the construction of a 75-ton mill. It will be remembered that the JOURNAL reported about a year ago that this property was supposed to be ready for a mill; at about that time one of the larger mines was found to be less rich in mine-run than at first reported. This announcement caused the Hibernia directors to recall a tentative contract. Since that time a more thorough exploitation of the ore deposits has been pursued, with gratifying results, and after carefully going over the whole matter they have concluded to erect a two-jig mill of Gooley type, seven cells each. The power will consist of a 16x36-in. Bates-Corliss engine operating non-condensing, steam to be furnished by two 60x16 boilers. A 12x12-in. belted compressor will be driven by the mill engine from a countershaft. The Hibernia mine is in the outskirts of the city of Platteville and is managed by representative business men. J. W. Murphy is president. The erection of a roaster and magnetic separating plant is contemplated in the near future, probably as soon as the percentages of the mill concentrates can be obtained.

PHILIPPINE ISLANDS

MASBATE

Mount Cogran Mining Company—The latest report is that on the company's Big Medicine claim, near Arroroy, the main vein has been crosscut at a depth of 100 ft. A general sample, taken across 10 ft. of the vein, ran high in gold.

Foreign Mining News

CANADA

NOVA SCOTIA

The total output of the Nova Scotia coal mines for 1906 was 5,213,000 tons, an increase of 53,000 tons over the production of 1905.

ONTARIO—COBALT DISTRICT

Cobalt Lake Mining Company, Ltd.—This company has been organized with $5,000,000 capital to take over and develop the bed of Cobalt lake, recently bought by a syndicate from the Ontario government. Sir Henry M. Pellatt, of Toronto, is president, the other directors being Britton Osler, Toronto, Thos. Birkett, G. F. Henderson, D. B. Rochester, H. S. Southam and Hon. Frank Latchford, Ottawa. John H. Avery, Detroit, and George E. Drummond, Montreal. The amount required for the purchase money was largely over-subscribed and considerable ill-feeling resulted. An action is being already brought against the company by subscribers who claim to have been wrongfully left out of the deal. The operations of the company, it is stated, will be pursued by sinking a shaft on the shore and drifting under the lake bed, the water being only 40 ft. deep. As the gravel at the bottom of the lake is rich, it is also proposed to dredge.

Kerr Lake Mine—The most notable event of the week occurred on the Kerr Lake (Jacobs) mine when, at the 65-ft. level, a cross-cut driven to the west, 12 ft. from No. 3 vein (supposed to be the main vein), encountered 12 in. or better of ore which is said to assay 25 per cent. silver.

Nipissing—A significant feature with reference to the Nipissing property is the the fact that there is at the property several hundred tons of unshipped ore.

The statement by the company that the net profits from production for the past six months amounted to $600,000 and the statement also by the company that the production for October alone amounted to $600,000 do not coincide.

ONTARIO—PARRY SOUND DISTRICT

J. S. Kuhn and W. S. Kuhn, of Pittsburg, Penn., have purchased 4000 acres of mineral lands in the neighborhood of Parry sound. Thomas A. Wood, engineer, of Parry Sound, acting on their behalf, has for some time been securing options on copper properties in this region, which were inspected by American mining engineers. On Dec. 29 these options, which include the McGowan, Wilcox and Spider Lake properties, were taken up, the sum invested amounting to $700,000. The most important of these mines is the McGowan, situated about 1½ miles from the town of Parry Sound. The property covers 140 acres. Development work was begun some three years ago, and there are three shafts, one of which is down 140 ft. The Wilcox is a low-grade proposition, 160 acres in extent, six miles south of Parry Sound. There are three shafts on the property, of 130, 20 and 30 ft. The Spider Lake mine lies to the west and carries what is practically a continuation of the Wilcox vein. The Kuhn purchases also include deposits on Moon river, some 12 miles south of Parry Sound. The latter place last fall secured direct railway communication with Toronto, 149 miles distant, by the opening of the Canadian Northern Ontario Railway. The principal properties are near deep water, assuring excellent shipping facilities. The plans for development will probably include the erection of a smelter in the district.

QUEBEC

The graphite deposits in the Laurentian district of northwestern Quebec are to be developed on a large scale by American capital. A. L. Dubois, vice-president of the Dry Concentrator Company, of New York, states that his company, which has secured 20 properties situated between Buckingham and Lavelle, will commence active mining operations shortly. There is already $500,000 worth of machinery on the spot.

MEXICO.

JALISCO.

Estado Mining Syndicate—It is learned on the best authority that as yet the Estado Mining Syndicate, the English company which holds the option on the small smelting plant in Guadalajara, owned by José S. Diaz and associates of that city has made none of the payments, and as the option expired the end of last month, it looks very doubtful whether the deal will be consummated, though the English people have paid out several thousands of dollars for various extensions on the option. It is strange too, that this option should be allowed to pass, for the smelting company has a nice little plant, conveniently located, and ready, on the completion only of stack and flue chambers, to blow in. Moreover, the English company has just purchased a large tract of mineral land in El Favor camp, near Tecalitlan, and is installing new machinery on the same, and is said to have some £200,000 for the furtherance of its plans, so that should it chose to go into custom smelting, as well as to smelt its own ores, it would be hard to find a better place than Guadalajara, whose growing importance as a railroad center makes it most desirable. As soon as men can be spared from the Mexican Central Railroad's Colima branch to the Pacific coast, they will be rushed onto the line to Autlan, about 50 miles distant from Colima, the center of a copper district, and to which point the locating engineers are running out from Colima; that finished the Guadalajara—San Marcos branch of the Mexican Central will be extended to San Blas and the Pacific. By that time the fast approaching lines of the Southern Pacific from Guaymas, Sonora, will have reached Guadalajara; all making that city the center of some of the richest mining and agricultural lands in the Republic.

Atrevido Mining and Milling Company—This company, made up principally of capitalists from, and with offices in, San José, California, has properties in the State of Jalisco, about 25 miles west of Ameca. It is now, after about four years' development work, under the management of Glanville Hart, making a splendid showing with its little 11-stamp mill and cyanide plant. Some 40 tons a day are treated, and from $10,000 to $12,000, United States currency, worth of gold bullion is being produced monthly. The ore itself averages about $10 in gold per ton. About 20 per cent. of the values is caught on the plate in front of the battery, whence it goes to the sand tanks—five of 4½x20 ft. diameter—and the slime tanks—six of 12x24 ft. diameter—by which a total extraction of 90 per cent. is obtained, with 36 hours' percolation in the sand tanks and 48 hours, with slight agitation, in the slime tanks. The resulting bullion runs from 800 to 900 fine gold, and the cost of mining and milling is said to be only $3, Mexican, per ton. Whether this includes administration or not was not learned, but this could not exceed at the most $1, Mexican, per ton, making a total say of $2 gold, or a profit of $8 gold per ton. The mine at present is less than 250 ft. deep.

OAXACA

Oaxaca District—Encouraged by excellent showing of his recently acquired San Juan mines, Chas. A. Hamilton, of Oaxaca, is getting control as far as he possibly can of the lead mines in the Oaxaca district, so they may be got in shape to put the Oaxaca Smelting and Refining Company, on whose smelting plant work is rapidly progressing and in which he is largely interested, on an independent footing as soon as it is ready to blow in. Mr. Hamilton is also preparing to start work on his San Geronimo & Taviche Railroad, which is to cross the Oaxaca & Ejutla at kilometer 40 of the latter, and to connect with the Zimatlan Railroad at San Pablo. This will aid greatly in the transportation facilities and development of the Taviche and Oaxaca districts. The San Martin, operated by F. Augustus Heinze, in Ejutla, is showing up some fine copper ore, and the Marseilles Mining Company, five miles southeast of Ejutla, has opened up about 15 ft. of copper ore on the 100-ft. level. The San Juan, in which Texas capital is interested, near the rich Conejo Blanco, of Hampson & Smith, has cut into a 6-ft. vein of rich sulphide ores, high in silver and lead. La Ventura Mining and Milling Company has been organized in West Virginia, with a capital of $400,000 Mexican, and G. I. Bentley, formerly of Cripple Creek, as president and general manager, to develop some 21 pertinencias (50 acres) in the Ocotlan district of Oaxaca, and adjoining El Guebesha, which is being operated by Kansas City people.

Coal Trade Review

NEW YORK, Jan. 9

In the West the car situation seems to be rather less acute, though there is still a great deal of complaint, both at mines and at delivery points. There seems to be more trouble at smaller towns than at the large consuming centers. Doubtless the railroads make stronger efforts to supply the large cities. The car shortage has served generally to keep up prices, preventing any flooding of the markets.

In the East trade has been quiet, especially in anthracite, the domestic use of which is small for the season, owing to the continued mild weather. The demand for steam coal is strong, and trade has been good in that class of coal all through the Eastern territory.

COAL-TRAFFIC NOTES

Shipments of coal and coke originating on the Pennsylvania Railroad Company's lines east of Pittsburg for the year to Dec. 29 were as follows, in short tons:

	1905.	1906.	Changes.
Anthracite	4,615,888	4,541,749	D. 74,139
Bituminous	30,386,521	32,204,912	I. 1,818,391
Coke	11,327,153	12,679,357	I. 1,352,204
Total	46,329,562	49,426,018	I. 3,096,456

There was a decrease of 1.6 per cent. in anthracite; increases of 6 per cent. in bituminous and 11.9 per cent. in coke; making an increase of 6.7 per cent. in the total tonnage.

Shipments of Broad Top coal over the Huntingdon & Broad Top Railroad for the week ending Dec. 31 were 24,906 tons; for the full year 1906 they were 833,818 tons.

Lake shipments of anthracite coal from Buffalo for the season were 2,785,362 tons in 1905, and 2,681,808 tons in 1906; a decrease of 103,554 tons. The larger shipments in 1906 were to Chicago, 939,407 tons; Duluth and Superior, 768,304; Milwaukee, 511,421; Fort William, Ont., 105,716 tons.

Shipments of Nova Scotia coal, by companies, for the 11 months ending Nov. 30 were as follows:

Companies.	1905.	1906.	Changes.
Dominion	2,725,897	2,997,780	I. 271,883
N. S. Steel	487,576	612,029	I. 124,453
Acadia	238,748	247,466	I. 8,718
Intercolonial	183,851	257,190	I. 73,339
Inverness	125,912	186,664	I. 60,752
Cumberland	377,108	358,832	D. 18,276
Total	4,139,092	4,659,961	I. 520,869

The total increase this year was 12.6 per cent.

New York Dec. 26

ANTHRACITE

The situation in the anthracite market remains practically the same as when last reported. There has been a great shortage of cars, and all producers have been complaining on this score. However, during the past week some operators report that this shortage has been relieved to a slight extent, whereas others still state that their needs are by no means supplied. The production at the mines is necessarily curtailed to a great extent, and the smaller sizes of coal are almost entirely out of the market. Pea, buckwheat and barley are very scarce. The call for domestic sizes continues strong, but the present warm spell has taken the edge from immediate demands. This has materially aided the railroads in moving coal to the New York market, and has enabled the operators to fill partially some of their back contracts. Prices remain at $4.75 for broken, $5 for egg, stove and chestnut. Steam sizes are $3 for pea, $2.25 to $2.50 for buckwheat; $1.50 for rice; $1.40 for barley; all f.o.b. New York harbor shipping points.

BITUMINOUS

The Atlantic-seaboard soft-coal trade remains generally strong, and prices continue the same with the exception of a small advance in some cases. The question of car supply still continues upper-

most with producers, and the supply of coal is limited by that factor. There seems to be a little better supply of cars on Baltimore & Ohio lines since the first of the year. This was possibly brought about by the action of some operators in taking up the question and investigating it thoroughly.

Trade in the far East is sending forward, into the hands of shippers, orders for large amounts and the demand for coal is becoming urgent from that territory. Trade along the Sound is very active and delays in unloading boats at the New Haven Railroad unloading ports are increasing, which is not helping the situation in this district. New York harbor trade is absorbing a great deal of coal. Things have been easier during the week on account of some railroad rulings, which brought considerable coal to New York harbor points. Good grades of steam coal are selling at from $2.80@3, with lower grades selling around $2.70 f.o.b. New York harbor shipping points.

All-rail trade is hauling considerable coal. In some quarters a small shortage is reported. Transportation from mines to tide is inclined to be sluggish and irregular. Car supply is an indefinite quantity, running from 10 to 50 per cent., according to territory and individual producer.

In the coastwise-vessel market vessels are in good demand and supply seems to keep fairly well up. We quote freight rates from Philadelphia to Boston, Salem and Portland, $1 and discharge; to the Sound, 85c.; all include the loading and discharging clause.

Birmingham Jan. 7

State Mine Inspector J. M. Gray has begun to receive figures as to the coal output in Alabama during the past year. The railroad car shortage has done more harm than has been anticipated. The weather in this section has not been unfavorable lately, but the congestion and the car shortage has interfered greatly with the traffic.

The demand for coke is strong and good prices obtain. There is need for all that is being manufactured and more, too.

According to official figures, 96 men lost their lives in the mines of Alabama during the year 1906.

The new interests acquiring the properties of the Woodstock Iron Company, including two furnaces, ore and coal lands, the latter being located in Jefferson county, are making preparations for active operation of the properties.

Chicago Jan. 7

Mild weather throughout the greater part of Chicago territory has made the demand for both bituminous and anthracite coal small in the last week. The Northwest, however, is calling for coal and cars for prompt shipments are being found by the railroads. In consequence the out-of-town shipments of Chicago and other firms are much larger than last week. The Illinois mines will be busy with the Western and Northwestern trade for two or three weeks to come, according to today's reports.

There is little coal on track, in consequence of the out-of-town demand, and local prices of both Eastern and Western coals continue about the same as for the last two or three weeks. Prepared sizes from Illinois and Indiana mines bring in carload lots, Chicago, $2@3.25; run-of-mine, $1.75@2.25, and screenings, $1.25@1.75. These prices, of course, are averages, the range in Western coals being wide.

Of Eastern coals, smokeless is perhaps firmest, though no coal can be called very firm under present conditions. The demand for smokeless seems to continue fair, and it is asserted by selling agents that the coal holds up firmly to the market quotations of $4.30 for prepared sizes, and $3.40 for run-of-mine. It is probable that these prices, which are quoted for Pocahontas and New River, are not adhered to in many sales; discounts from them, particularly on run-of-mine, are said to range 10@25c.

Hocking is easier and the current quotation, $3.65, is said to be shaded as much as 25c. on important sales. The price of Hocking in the local market has for several months been considered unreasonably high by many local consumers. Youghiogheny is in better supply at $3.40 and Pittsburg is notably lower, with No. 8 at about $2.75. Anthracite is in very small demand, because of the mild weather.

Cleveland Jan. 8

The mild weather of the past week, with its attendant lack of difficulty in railroad operation and light consumption of coal, has introduced further weakening factors in the coal market. The decline in prices has not been sharp, but the downward trend is continued. The movement to this market is liberal and there is little or no difficulty in getting about all the coal a consumer needs. The mild weather is not inclined to induce the storage of coal against needs and in consequence the trade has been rather slow. It is reported that mine-run steam coal from Ohio mines is selling about on the basis of $1.15@1.20 at mines, while Pennsylvania mine-run is on the basis of $1.10 at mines. Pennsylvania slack is selling still at 85c. at mines, while Ohio slack is close to $1.

During the week a break in the natural-gas main leading into Cleveland left the city without that sort of fuel. The result was a sudden demand for domestic coal. The weather was not very cold, but the demand was active. This complicated a situation already strained. The price of domestic coal did not move up, however, and Massillon selected lump is still selling on the basis of $2.35 at the mines.

The demand for coke is increasing. The market price is strong, both for spot shipment and on contract, at $4.25 at oven for the best grades of 72-hour foundry coke. The best grades of furnace coke are selling at $3.50@3.60 at oven.

Hartshorne, Ind. Ter. Jan. 1

The severe car shortage still continues in the Southwest, and the mines in many sections are working only half time or less. The railroads are demanding a large amount of what fuel is produced, so that many towns and industries are suffering a severe coal famine, and it is hard to predict how some people would pull through an extreme cold snap should one occur.

Pittsburg Jan. 8

Coal—The year opened with prices much stronger and contracts are made for the year at advances ranging from 10 to 20 per cent. When contracts were made a year ago it was believed the mining rate would be unchanged, or possibly lower. Instead there was an advance of about 6 per cent. As the present mining scale will not expire until April 1, 1908, operators expect to make some money out of the business this year. Quotations are on a basis of $1.45 to $1.55 for mine-run coal. There was a good boating stage in the rivers all last week, but there were no shipments, as all the coal loaded had gone out on the previous rise. The Pittsburg district convention of the United Mine Workers opened this morning and will remain in session all week. The national convention will be held in Indianapolis, beginning Jan. 15. These meetings are not expected to be particularly interesting, as there will be no mining scale to adjust this year.

Connellsville Coke—Furnace coke is well sold up for delivery in the first half, but production, which fell off during the holiday season, is increasing. Furnace coke for January delivery is quoted at $3.40@3.50, and for shipments extending through the year at $3@3.15. Foundry coke is quoted at $4.10@4.25 for prompt and $3.85@4 for all year.

Foreign Coal Trade

Jan. 9

Exports of coal and coke from the United States for the 11 months ended Nov. 30 are reported by the Bureau of Statistics as below, in tons:

	1905.	1906.	Changes.
Anthracite	2,082,483	2,045,666	D. 36,817
Bituminous	6,478,739	7,069,005	I. 590,266
Total coal	8,561,222	9,114,671	I. 553,449
Coke	552,948	705,988	I. 153,040
Total	9,114,170	9,820,659	I. 706,48

The coke went chiefly to Mexico and Canada. The distribution of the coal exports was as follows:

	1905.	1906.	Changes.
Canada	6,529,926	6,941,344	I. 411,418
Mexico	827,970	1,011,759	I. 183,789
Cuba	519,072	604,321	I. 85,249
Other W. Indies	277,020	285,781	I. 8,761
Europe	98,932	80,977	D. 17,955
Other countries	308,302	190,489	D. 117,813
Total	8,561,222	9,114,671	I. 153,449

The exports to Europe were chiefly to Italy; those to other countries, to South America. The exports to Canada—76.2 per cent. of the total in 1906—were, in detail, as follows:

	1905.	1906.	Changes.
Anthracite	2,046,163	2,011,627	D. 34,536
Bituminous	4,483,763	4,929,717	I. 445,954
Total	6,529,926	6,941,344	I. 410,418

There was a small decrease in anthracite, but a considerable gain in bituminous coal.

Imports of coal and coke into the United States for the 11 months ending Nov. 30 are reported as follows, in tons:

	1905.	1906.	Changes.
Great Britain	58,013	99,539	I. 41,526
Canada	1,184,583	1,300,978	I. 116,395
Japan	41,956	10,812	D. 31,144
Australia	165,282	168,662	I. 3,380
Other countries	397	6,059	I. 5,662
Total coal	1,450,231	1,586,050	I. 135,819
Coke	64,988	118,135	I. 53,147
Total	1,515,219	1,704,185	I. 188,966

Of the coal imported in 1906 there were 29,382 tons classed as anthracite. Some Nova Scotia coal comes to New England ports, but the bulk of the imports of coal are on the Pacific coast. The coke is chiefly from British Columbia, though a little comes from Germany.

Iron Trade Review

NEW YORK, Jan. 9

The holidays interposed a check on business, and it has been quieter during the week than for some time past. This applies to new business, but not to the activity at mills and furnaces. Deliveries on contracts are being urged, and consumers seem to have use for all material which is coming to them. The holiday stops were, in most cases, made as short as possible. The loudest call just now is for structural material for buildings, and for plates, beams, etc., for Lake shipbuilding.

Car shortage and railroad delays are causing some trouble in the iron trade. Deliveries of raw material are kept back, and mill yards are congested, while consumers complain of slow deliveries. Since the opening of the year there has been a little improvement in this respect, but not much.

Iron and Steel Exports—Exports of iron and steel, and of machinery, from the United States for the 11 months ending Nov. 30 are valued by the Bureau of Statistics of the Department of Commerce and Labor as follows:

	1905.	1906.	Changes.
November	$13,348,028	$15,145,996	I. $1,797,968
Eleven months	128,944,252	157,755,316	I. 28,811,064

The increase was 13.5 per cent. for November, and 22.3 per cent. for the 11 months. The leading items of export for the 11 months were as follows, in long tons:

	1905.	1906.	Changes.
Pig iron	45,779	75,052	I. 29,273
Billets, ingots & blooms	203,132	186,479	D. 16,653
Bars	48,382	80,110	I. 31,728
Rails	273,306	296,873	I. 23,567
Sheets and plates	68,507	102,794	I. 34,287
Structural steel	73,469	101,275	I. 27,806
Wire	129,845	160,844	I. 30,999
Nails and spikes	44,397	56,062	I. 11,665

The larger exports of rails in 1906 were to South America, 106,040 tons; Canada, 65,672; West Indies, 31,350; Mexico, 22,977; Japan, 22,393 tons.

Iron and Steel Imports—Imports of iron and steel, including machinery, into the United States for the 11 months ending Nov. 30 are valued by the Bureau of Statistics as below:

	1905.	1906.	Changes.
November	$2,091,998	$3,055,823	I. $963,825
Eleven months	23,912,947	30,840,473	I. 6,927,526

The increase for November was 46.1 per cent., for the 11 months 29 per cent. The more important items of the exports for the 11 months were, in long tons:

	1905.	1906.	Changes.
Pig iron	185,890	305,416	I. 119,526
Scrap	15,740	18,379	I. 2,639
Ingots, blooms, etc	12,742	19,139	I. 6,397
Bars	34,148	31,458	D. 2,690
Wire-rods	16,054	16,269	I. 215
Tin-plates	62,433	48,969	D. 13,464

The noticeable points are the increase in pig iron and the decrease in tin-plates.

Iron Ore Movement—Exports and imports of iron ore in the United States for the 11 months ending Nov. 30 are reported as below, in long tons:

	1905.	1906.	Changes.
Imports	771,001	992,283	I. 221,282
Exports	198,715	264,764	I. 66,049

Most of the exports were to Canada. Cuba furnished the greater part of the imports, but some ore came from Canada and a little from Spain.

Imports of manganese ore for the 11 months were 238,828 tons in 1905, and 191,578 tons in 1906; a decrease of 47,250 tons.

Baltimore Jan. 8

Imports of spiegeleisen for the week were 730 tons; of ferro-manganese, 749 tons; of ferro-silicon, 187 cases. Arrivals of iron ore for the week were three cargoes, 12,700 tons, from Cuba; two cargoes, 10,597 tons, from Beni-saf, Algeria; a total of 23,297 tons.

Birmingham Jan. 7

Were it not for the wretched conditions with the railroads, the iron market in the South would start off in the new year as well as could be expected by anyone. There is a good demand for iron, delivery at any time during the first three-quarters of the year, while some inquiries are already in hand for fourth-quarter iron. Iron wanted during the first three months is considered the same as spot, and brings a premium. Such iron is almost out of the question. Stiff prices obtain for second-quarter iron. The railroad situation shows little, if any, improvement for the new year. The production is a little better than it was but not to a great amount. The Tennessee Coal, Iron and Railroad Company blew in one furnace at Bessemer during the past week, but put one out of commission a few days later.

Joseph Hoadley, the newly elected president of the Alabama Consolidated Coal and Iron Company, who is in the Birmingham district looking over the properties of the company, intimates that several million dollars will be expended in betterments. A rumor is afloat in Alabama that there is likely to be an absorption of the properties of the Alabama Consolidated.

All labor in the Birmingham district which laid off for the holidays has returned to work and all operations are on as they were two weeks before the holiday season.

Quotations for iron are given as follows: First quarter, No. 2 foundry, $23@24; second quarter, $20@21 per ton; third quarter, $18.50@19.50; fourth quarter, $17.50@19 per ton.

Chicago Jan. 7

The local demand for pig iron continues apparently unabated, with the prospect that there will be large sales to cover second-half requirements as soon as the business of the new year is fairly in swing. There is no weakening anywhere though immediate sales are not large. It is characteristic of the Chicago market that it does not settle down to active buying after the new year's crossing mark, until two or three weeks have given the index to business. Now there is an apprehension in the local business world, that the period of over-production is near at hand, and it would not be surprising if the iron market, one of the most sensitive of trade barometers, should feel this and become conservative.

Prices continue firm, available lots of Northern bringing $26@27 for delivery in the first half, and Southern being quoted at $22.50@23.50, Birmingham, for first-quarter deliveries, $19@20 for second-quarter, and $18@19 for third-quarter. The local market for iron and steel products is strong, but there are indications of conservatism; building material especially is in a quiescent stage.

Coke continues high in price, but somewhat easier in supply, $6.40 being quoted for the best Connellsville. The supply is still inadequate.

Cleveland Jan. 8

Iron Ore—Only a few small sales have been reported during the week for 1907 delivery. In the higher-grade ores the prices have shown a slight premium over those prevailing on the regular yearly quotations. The principal matter of interest in this connection is the sale off stock-piles which has been started. The purpose

of this is to get a higher grade of ore than was shipped down the lakes during the past year. The movement from lake stock-piles to the furnaces has started earlier than usual and promises to wipe out the stocks on hand, before the opening of navigation.

Pig Iron—The market is showing the same dullness as is seen, generally, at the end of the year and the beginning of the next. The question is being asked whether the present quietness in the trade is a premonition of what is to come. Those who have followed the market for years are of the opinion it is only the regular year-end lull. The supply of basic for immediate delivery is more plentiful, but prices have not been forced down below $25. During the past week more receipts of foreign foundry have been obtained. These analyze about equal to southern irons and are used in mixtures. The price for spot shipment of Northern No. 2 holds at $25.50 at furnace, while second-hand material is still being sold freely on the basis of $21.50 at furnace.

Finished Material—The market is about on an even keel, with a slight but temporary lessening of the demand for structural and plates, although there are heavy specifications on contracts, amounting to anticipation of needs.

New York Jan. 9

Pig Iron—There is rather a lull in new buying, and it looks like a quieter time for a week or two. At the same time holders of contracts are urging delivery on them.

There is no material change in prices, the outside figures given below being for first quarter delivery.

Current quotations for pig iron are for New York or parallel delivery:

Northern:	
No. 1 X foundry	$ 26@$27
No. 2 X foundry	24.50@26
No. 2 plain	24@25.50
Forge pig	20.50@22
Southern:	
No. 1 foundry	23.50@27
No. 2 foundry	23@26.50
No. 3 foundry	22@25.50
No. 4 foundry	21@24.50
No. 1 soft	24@27
No. 2 soft	24@26.50
Gray forge	20@21.50
Basic pig:	
Northern	22@23.50
Virginia	22@23.25
Alabama	22@23.50
Foreign:	
Scotch foundry, ex-ship	24.50@25
Middlesboro, No. 1, ex-ship	23.50@24
Middlesboro, No. 2, ex-ship	22.50@23

City or local deliveries are not included in prices, which are for large lots, on docks or cars. Foreign irons are quoted ex-ship, duty paid.

Cast Iron Pipe—For spring delivery $35@35.50 per ton is quoted for 6-in. pipes, carload lots, at tidewater. Orders are coming in freely.

Bars—Bars are strong at 1.845c. tidewater, for common iron, while refined is 1.895c. Steel bars are quoted at 1.745@1.845c., according to size and conditions of orders. Store trade is good at 2.50c. delivered.

Plates—For tidewater delivery, carload lots, prices are: Tank, 1.845@2.045c.; flange, 1.945@2.145c.; marine, 2.245@2.445c., according to width. Eastern mills today decided on an advance of $2 per ton.

Structural Material—Prices are nominally unchanged, but premiums continue to be paid to secure deliveries.

Rail—Business here is mainly in trolley rails; light rails are in demand also.

Old Material—Foundry scrap is still wanted, No. 1 machinery selling at $18.50@19.50. Heavy steel melting scrap brings $16.25@17, and is in demand.

Philadelphia Jan. 9

Pig Iron—Only a small amount of business has been contracted for this week in crude iron, and even the inquiries which have been hanging around the horizon of the market, in some cases as long as a month, have not resulted in orders, because the pig-iron people are both unwilling and unable to accommodate their customers as to terms of delivery. Another reason is that the current quotations are above what some of our larger consumers believe can be maintained. These are the general conditions. A great deal of business could be done in basic iron if the makers were ready. Quotations are $26.50 for No. 1 X; $24 for No. 2 X; $23.50 for No. 2 plain; $22.50 for best gray forge and basic is nominally $24. Scotch and English irons remain about where they were.

Steel Billets—There has been no business of importance to note, though the mills have offers before them for large quantities.

Bars—The mills are reported in our city offices as booking more than usual business for this time of January. Consumers are anxious to obtain all the iron coming to them, strictly according to contract.

Sheets—The demand for all kinds of sheets in a retail way is perceptibly better than for two or three weeks, but in large lots. There have been no contracts placed worth mentioning.

Pipes and Tubes—Some additional orders have gone to the mills for tubes at the recent advance.

Plates—Our plate mills are gorged with business and the manufacturers speak of the pressure upon them both by large and small buyers. Steel plate is extremely active, and a number of the smaller buyers who use boiler plate are now arranging for supplies.

Structural Material—Nothing of importance has occurred in this market. There is a great deal of unplaced business in the background, but no efforts are being made at present to push the negotiations farther along.

Steel Rails—The steel-rail situation is very hard to define. The advance made by two or three concerns to $30, it is not thought will be followed by the United States Steel Corporation. The agents of the various rail-makers are soliciting a good deal of business in small lots, which has been hanging fire for some time, and the companies will endeavor to accommodate their little customers from now on.

Scrap—The scrap dealers are holding what supplies they have at outside figures and are more concerned in getting control of scrap than finding buyers for it.

Pittsburg Jan. 8

The iron and steel markets continue quiet, but there have been some fairly good transactions in pig iron. A great deal of interest is taken in the steel-rail trade. It is estimated that over 2,000,000 tons of bessemer steel rails have been booked for delivery this year at the rate of $28 a ton, which was established early in 1901. Mills are not anxious to take on any more business at present, and when some orders were booked recently by the Carnegie Steel Company from Western roads it was reported that the Illinois Steel Company was sold up for the year. It is believed, however, that the company is reserving some of its capacity. Rumors a week ago that the Cambria and Pennsylvania steel companies are quoting $30 for standard bessemer steel rails were practically confirmed this week. It is believed that these companies are not desirous of booking any orders at the ruling price, as more can be obtained for billets. There seems to be no doubt that premiums on rails will be paid, in some instances, before the end of the year for deliveries on rails ordered. As told in a recent letter the Bethlehem Steel Company has re-entered the rail market, and will begin making deliveries about July 1. It will make open-hearth rails exclusively, and although there has been no official announcement, it is reported here that the price for open-hearth rails will be at least $32 a ton, and may go higher, if bessemer rails bring a higher price than $28. The Tennessee Coal, Iron and Railroad Company has been making open-hearth rails and early last year quoted $29 at mill, or $1 a ton above the rate for bessemer. All rail quotations are f.o.b. mill, and Western roads that cannot get their requirements from the Illinois Steel Company and the Colorado Fuel and Iron Company pay a higher price delivered for rails bought from the Carnegie Steel Company, the freight rate being greater. Since the first of the year the Carnegie company has booked about 20,000 tons of standard bessemer steel rails and a small tonnage of light steel rails, on which an advance in prices was recently ordered. New prices of light rails are as follows: 25 to 45-lb., $33@34; 20-lb., $24@25; 16-lb., $35@36; 12-lb., $36@37; 8 and 10-lb., $40@41. These are the highest prices ever quoted by this com-

pany, and it is understood it cannot guarantee delivery inside of four months.

The mills are behind in deliveries on all finished lines from one to four months, and while there has not been much buying lately, all are crowded with specifications on old contracts. Stocks of sheets and tin-plate are lighter than at any time at the opening of a new year, and it will be necessary to increase production greatly to take care of the usual spring trade. The leading interest officially announced that, contrary to reports, it does not intend to advance prices. In sheets, however, premiums are being paid for prompt delivery. The iron and steel bar markets are strong. Steel bars are strictly held at the recently established prices of 1.60c. and iron bars are firm at 1.80@1.85c. Pittsburg.

Pig Iron—Peculiar conditions continue in the pig-iron market, foundry iron ruling at a higher rate than bessemer, although it is made from a cheaper grade of ore. A sale of 1500 tons of No. 2 foundry was made yesterday for delivery in the third quarter at $21.50, Valley furnaces. Some bessemer and basic has sold for this delivery at $21, and the leading independent producer is quoting $21@21.25 for bessemer and $20.75@21 for basic for third-quarter delivery. Sales of small lots of No. 2 foundry were made during the past few days at $25, Valley, and a lot of 4000 tons of bessemer for delivery through the first half was sold at $22, Valley. Bessemer for delivery in the first quarter was sold late last year at prices ranging from $22.50 to $23.50. Since the first of the year it is reported that over 15,000 tons of foundry and bessemer were sold for third- and fourth-quarter deliveries. Virginia iron has advanced and No. 2 X is quoted this week at $24@24.50 at the furnaces. An advance of 25c. a ton in freight rates on pig iron from the Virginia furnaces went into effect on Jan. 1, and the rate from Birmingham, Ala., will be increased 25c. on Feb. 1.

Steel—Billets continue extremely scarce, and prices are nominal, bessemer being quoted at $29.50@30 and open-hearth, $32.50@33. Plates are firm at 1.70c., and merchant steel bars at 1.60c.

Sheets—The market continues strong and premiums can easily be obtained for prompt delivery. Black sheets remain at 2.60c. and galvanized at 3.65c. for No. 28 gage.

Ferro-Manganese—The market is irregular and quotations vary from $82 to $83 for prompt to $80 to $81 for future delivery.

Cartagena, Spain Dec. 22

Iron and Manganiferous Ores—Messrs. Barrington & Holt report that shipments for the week were one cargo, 3900 tons dry ore, to Great Britain; one cargo, 5300 tons dry ore, to Philadelphia. The market is active, but freight tonnage is scarce.

Quotations are, for iron ore, f.o.b. shipping port: Ordinary 50 per cent. ore, 9s. 9d.@10s.; special low phosphorus, 10s. 3d.@10s. 6d.; specular ore, 58 per cent., 13s.; S. P. Campanil, 11s. 6d. Manganiferous ores, same terms, are 14s. 6d. for 35 per cent. iron and 12 per cent. manganese; no higher grades offered.

Pyrites—Iron pyrites, 40 per cent. iron and 43 sulphur, are quoted at 11s. 6d. per ton.

Metal Market

NEW YORK, Jan. 9

Gold and Silver Exports and Imports.

At all United States Ports in November and year.

Metal.	Exports.	Imports.	Excess.
Gold:			
Nov. 1906...	$1,963,757	$ 8,934,958	Imp. $6,971,201
" 1905 .	1,137,318	5,202,790	" 4,065,472
Year 1906..	44,831,203	147,961,827	" 103,130,624
" 1905..	44,125,935	46,264,524	" 2,138,589
Silver:			
Nov. 1906...	4,411,830	2,914,157	Exp. 1,497,673
" 1905 ..	5,361,819	4,306 838	" 1,054,981
" 1906 ..	53,400,246	39,790,748	" 13,609,498
1905 ..	49,316,953	31,246,389	" 18,070,564

These statements cover the total movement of gold and silver to and from the United States. These figures are furnished by the Bureau of Statistics of the Department of Commerce and Labor.

Gold and Silver Movement, New York.

For week ending Jan. 5 and years from Jan. 1.

Period.	Gold.		Silver.	
	Exports.	Imports.	Exports.	Imports.
Week....	$ 6,000	$ 109,247	$531 981	$ 100,384
1907.....	6,000	109.247	531,981	100,384
1906	518,000	26,276	3,973,138	42,947
1905.....	2,357,370	32.100	755 921	29,699

Exports of gold for the week were to Haiti; of silver to London. Imports, both gold and silver, were from the West Indies, Mexico and South America.

The joint statement of all the banks in the New York Clearing House for the week ending Jan. 5 shows loans, $1,049,567,500, an increase of $16,694,500 for the week; deposits, $1,000,578,300, an increase of $19,277,200. Reserve account shows:

	1906.	1907.
Specie.....	$167,336,000	$172,951,400
Legal tenders.....	79,170,700	77,341,000
Total.....	$246,506,700	$250,292,400
Surplus.....	$571,000	$147,825

The surplus over legal requirements shows a decrease of $5,221,400, as compared with the previous week.

Specie holdings of the leading banks of the world on Jan. 5 are reported as below, in dollars:

	Gold.	Silver.	Total.
Ass'd New York	.....	.....	$172,941,400
England.....	$151,414,230	.....	151,414 230
France.....	532,963,225	$198,087,600	731,050.825
Germany	124,690,000	41,565,000	166,255,000
Spain..	77,070,000	121,060,000	198,130,000
Netherlands...	27,682,500	28.877,000	56.559,500
Belgium.....	16,756,665	8,378,335	25,135,000
Italy.....	160,165,000	22,990,000	183,155,000
Russia.....	587,900,000	23,425,000	611,325,000
Aust-Hungary.	233,045,000	58,755,000	291,800,000
Sweden.....	19,735,000	.....	19,735,000

The banks of England and Sweden report gold only. The New York banks do not separate gold and silver in their reports.

Shipments of silver from London to the East are reported by Pixley & Abell as follows, for the year to Dec. 27:

	1905.	1906.	Changes.
India.....	£7,230,421	£ 14,867,196	I. £ 7,636,775
China.....	886.847	430,700	D. 456,147
Straits..	38,299	1,750	D. 36,549
Total.....	£ 8 155,567	£ 15.299 646	I. £ 7,144,079

Receipts for the week were £318,000, of which £105,000 in bars and £24,000 in Mexican dollars were from New York. Exports were £177,100 in bars and £35,500 in Mexican dollars to India; £51,200 to Hobson's Bay; £263,800 in all.

Indian exchange continues steady, all the Council bills offered in London being taken at an average of 16.05d. per rupee. The Indian government is reported to be buying silver in London for coinage.

Prices of Foreign Coins

	Bid.	Asked
Mexican dollars.....	$0.53	$0.55
Peruvian soles and Chilean.....	0.47½	0.49
Victoria sovereigns.....	4.85½	4.87½
Twenty francs.	3.86	3.89
Spanish 25 pesetas...	4.78	4.80

SILVER AND STERLING EXCHANGE.

Dec.-Jan.	Sterling Exchange.	Silver. New York, Cents.	Silver. London, Pence.	January.	Sterling Exchange.	Silver. New York, Cents.	Silver. London, Pence.
27	4.82¾	69⅝	32⅛	3	4.84	70⅛	32 7/16
28	4.82¾	69¾	32⅛	4	4.84¾	70	32⅛
29	4.82¾	69⅝	32⅛	5	4.84¾	69¾	32 5/16
31	4 83	69⅝	32 5/16	7	4.84¾	70	32⅛
1	....	....	32⅛	8	4.84¾	69¾	32 5/16
2	4.84	69 ⅞	32 7/16	9	4.84¾	69½	32⅛

New York quotations are for fine silver, per ounce Troy. London prices are for sterling silver, 0.925 fine.

Other Metals

Daily Prices of Metals in New York.

January.	Copper. Lake, Cts. per lb.	Copper. Electrolytic, Cts. per lb.	Copper. London, £ per ton.	Tin. Cts. per lb.	Lead. Cts. per lb.	Spelter. New York, Cts. per lb.	Spelter. St. Louis, Cts. per lb.
3	24½ @24⅝	23⅝ @24	103½	41¼	6.00	6.70 @6.75	6.55 @6.60
4	24⅝ @24½	23¾ @24	105 7/16	41¼	6.00	6.70 @6.75	6.55 @6.60
5	24⅜ @24⅝	23⅝ @24¼	.....	41¼	6.00	6.70 @6.75	6.55 @6.60
7	24⅜ @25	24 @24¼	106 7/16	41⅝	6.00	6.70 @6.75	6.55 @6.60
8	24⅜ @25	24 @24⅜	106 3/8	41⅜	6.00	6.70 @6.75	6.55 @6.60
9	24⅜ @25	24 @24¼	106⅜	41⅜	6.00	6.70 @6.75	6.55 @6.60

London quotations are per long ton (2240 lb.) standard copper, which is now the equivalent of the former g.m.b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars, and represent the bulk of the transactions as made with consumers, basis, New York, cash. The price of cathodes is 0.125c. below that of electrolytic. The lead prices are those quoted by the American Smelting and Refining Company for near-by shipments of desilverized lead in 50-ton lots, or larger. The quotation on spelter are for ordinary western brands; special brands command a premium.

There was an error in the average prices of Lake copper in December and the year 1906, as given last week, which was due to a mistake in transcribing. The correct average for December is 23.350c.; for the year, 19.616c. These figures will be found in the table on the following page.

Copper—Toward the end of last week several good-sized orders were placed for domestic consumption at advancing prices, but since Monday the market has been quiet, and extremely firm. The scarcity of supplies has brought about higher prices and small transactions continue to be reported at fancy prices. The market closes firm at 24½@25 for Lake copper and 24@24¼ for electrolytic in ingots, cakes and wirebars. The average at which business has been done in casting copper is 23½@24 cents.

Standard copper has been steady and fluctuated within narrow limits. The close is cabled at £106 7s. 6d. for spot and £106 15s. for three months'.

Refined and manufactured sorts we quote: English tough, £109; best selected, £113@114; strong sheets, £114@115.

Exports of copper from New York for the week were 2883 long tons. Our special correspondent reports the exports from Baltimore at 1803 tons of copper.

Copper Exports and Imports—The exports of copper from the United States for the 11 months ending Nov. 30 are reported as below by the Bureau of Statistics of the Department of Commerce and Labor, in long tons:

	1905.	1906.	Changes.
Great Britain	25,069	22,436	D. 2,633
Belgium	2,131	2,727	I. 596
France	28,761	33,424	I. 4,663
Italy	6,465	7,883	I. 1,418
Germany and Holland	95,648	103,009	I. 7,361
Russia	8,013	3,671	D. 4,332
Other Europe	10,554	10,427	D. 127
Canada	1,172	1,764	I. 592
China	35,088	2,202	D. 32,886
Other countries	7,286	231	D. 7,055
Total metal	220,187	187,774	D. 32,413
In ores and matte	5,416	4,983	D. 433
Total	225,603	192,757	D. 32,846

The total decrease was 14.6 per cent. If, however, we omit the shipments to China in both years, there was an increase of 40 tons in 1906. The actual quantities of ore and matte exported in 1906 were 41,602 tons, of which 31,829 tons went to Canada, 9992 tons to Mexico, and 281 tons to other countries. Contents are estimated on the basis of values.

Imports into the United States of copper and copper material for 11 months ending Nov. 30, with re-exports of foreign metal, are reported as follows; the figures give the contents of all material in long tons of fine copper:

	Metal.	In ores, etc.	Total.
Mexico	34,748	13,453	48,201
Canada	13,194	4,391	17,585
Great Britain	9,342	.....	9,342
Japan	2,720	.....	2,720
South America	.....	1,846	1 846
Other countries	12,120	1,059	13,179
Total	72,124	20,749	92,873
Re-exports	499	88	587
Net imports	71,625	20,661	92,286
Net imports, 1905	65,083	19,932	85,015

The total increase in the net imports this year was 7271 tons, or 8.5 per cent. The actual tonnage of ores and matte imported from Mexico this year was 93,160 tons; from Canada and Newfoundland, 66,842; from South America, 8781 tons.

The excess of exports over imports was 145,590 tons in 1905, and 100,471 tons in 1906; a decrease of 45,119 tons.

Copper Sheets—The base price of copper sheets has been advanced 2c. and is now 29c. per lb. This price is subject to change without notice.

Tin—Absolutely no interest is shown in this metal, and buyers in this market are pursuing a hand-to-mouth policy. In consequence of this transactions are of a retail nature only and prices at the close are quoted at 41½c.

The London market has been strong one day and the next day weak, but closes steady at £189 10s. for spot and £190 5s. for three months.

Imports of tin into the United States for the 11 months ending Nov. 30 are reported as below, in long tons, of 2240 lb. each:

	1905.	1906.	Changes.
Straits	17,635	13,464	D. 4,171
Australia	539	897	I. 358
Great Britain	18,016	24,025	I. 6,009
Holland	411	487	I. 76
Other Europe	763	1,377	I. 614
Other countries	42	243	I. 201
Total	37,406	40,493	I. 3,087

The increase in 1906 over the preceding year was 8.2 per cent. The metal received from Great Britain is chiefly Straits tin.

Lead—The market remains unchanged at 6c. New York.

The London market has become a good deal stronger and closes at £19 17s. 6d. for Spanish lead; £20 for English lead.

Imports of lead into the United States in all forms, with re-exports of imported metal, are reported as below for the 11 months ending Nov. 30, in short tons, of 2000 lb. each:

	1905.	1906.	Changes.
Lead, metallic	4,012	11,425	I. 7,413
Lead in ores and base bullion	85 913	65.586	D. 20,327
Total imports	89,925	77,011	D. 12,914
Re-exports	56,022	44,444	D. 11,578
Net imports	33,903	32,567	D. 1,336

Of the total imports in 1906, there were 60,478 tons from Mexico, 8437 tons from Canada, and 7889 tons from Europe. Exports of domestic lead were 259 tons in 1905 and 292 tons in 1906; an increase of 63 tons.

Spanish Lead Market—Messrs. Barrington & Holt report from Cartagena, Spain, under date of Dec. 22, that the price of pig lead has been 89 reales per quintal, silver being paid for at 14 reales per ounce. Exchange, 27.62 pesetas to £1. The price of lead, on current exchange, is equal to £18 6s. 9d. per long ton, f.o.b. Cartagena. Exports for the week were 194 tons argentiferous lead to Marseilles.

Spelter—The demand continues at a very satisfactory rate both for near-by and future shipments. The market closes firm at 6.70@6.75c. New York, and 6.55@6.60c. St. Louis.

London reports a quiet market and closes at £27 15s. for good ordinaries and £28 for specials.

Exports of spelter from the United States for the 11 months ending Nov. 30 were 3688 short tons in 1905, and 4215 tons in 1906; an increase of 527 tons. Exports of zinc dross were 13,590 tons in 1906; previous to that year this article was not reported separately. Exports of zinc ore were 22,747 tons in 1905, and 24,750 tons in 1906; an increase of 2003 tons. Imports of spelter for the 11 months were 510 short tons in 1905, and 2192 tons in 1906; an increase of 1682 tons.

Spanish Zinc Ore Market—Messrs. Barrington & Holt report from Cartagena, Spain, under date of Dec. 22, that shipments for the week were 233 tons blende to Swansea, and 4225 tons blende and calamine to Antwerp. Prices are rather depressed, and demand uncertain.

Zinc Sheets—The base price was again advanced 15c. on Jan. 8, and is now $8.40 per 100 lb. (less discount of 8 per cent.) f.o.b. cars at Lasalle and Peru, in 600-lb. case for gages No. 9 to 22, both inclusive; widths from 32 to 60 in., both inclusive; the lengths from 84 to 96 in., both inclusive. The freight rate to New York is 27.5c. per 100 pounds.

Antimony—There is no material change. Quotations are 26@26¼c. for Cookson's; 25@25¾ for Halletts; and 24@24½ for ordinary brands.

Imports of antimony into the United States for the 11 months ending Nov. 30 were as follows, in pounds:

	1905.	1906.	Changes.
Metal and regulus	4,952,540	6,689,667	I. 1,737,127
Antimony ore	1,660,003	1,790,740	I. 130,737

The increase in metal and regulus was 35.1 per cent.; in ore, 7.9 per cent.

Nickel—For large lots, New York or other parallel delivery, the chief producer quotes 45@50c. per lb., according to size and terms of order. For small quantities prices are 50@65c., same delivery.

Imports of nickel ore and matte into the United States for the 11 months ending Nov. 30 were 12,344 tons in 1905, and 13,810 tons in 1906; an increase of 1466 tons. Exports of nickel, nickel oxide and nickel matte were 8,890,187 lb. in 1905, and 9,884,187 lb. in 1906; an increase of 994,000 lb. last year.

Platinum—Demand continues strong and prices high, with an upward tendency. Unmanufactured platinum is quoted at $38 per oz. For good scrap $31@31.50 is paid.

Imports of platinum into the United States for the 11 months ending Nov. 30 were 6586 lb. in 1905, and 10,561 lb. in 1906; an increase of 3975 lb. last year.

Quicksilver—There is no change. New York prices are $40.50@42 per flask of 75 lb., according to size and conditions of order. San Francisco prices are $39@40 per flask for domestic orders, and $37@38 for export trade. The London quotation is £7 per flask, with £6 18s. 9d. asked by jobbers.

Exports of quicksilver from the United States for the 11 months ending Nov. 30 were 908,58 lb. in 1905, and 465,401 lb. in 1906; a decrease of 443,157 lb. last year.

Aluminum—Prices are steady and demand good. Prices for ton lots, or over, are: No. 1, over 99 per cent. pure metal, 36c. per lb.; No. 2, over 90 per cent., 34c. Small lots are 1 to 3c. higher, according to size. Rods, according to size, are 1c. per lb. up, over the price of ingots. Granulated metal is 2c. per lb. over ingots.

Exports of aluminum from the United States for the 11 months ending Nov. 30 were valued at $265,816 in 1905, and $318,915 in 1906; an increase of $53,099 last year.

Minor Metals—For minor metals and their alloys, wholesale prices are, f.o.b. works:

	Per Lb.
Cadmium, 99.5% f. o. b. Hamburg	1.40@1.46
Chromium, pure (N. Y.)	90c.
Copper, red oxide	50c.
Ferro-Chrome (70)	13c.
Ferro-Chrome (7-9% carbon, per lb. Cr.)	9@9½c.
Ferro-Chrome (1% C. for ea. 10% Cr.)	11c.
Ferro-Chrome (60-64% Cr., 3-4% C.)	14c.
Ferro-Chrome (60-70% Cr., 1% C. or less)	38c.
Ferro-Molybdenum (50%)	1.00
Ferro-Titanium (20%)	80c.
Ferro-Tungsten (37%)	30c.
Ferro-Vanadium (25-50%, per lb. vanadium contents)	$7.20@7.50
Magnesium, pure (N. Y.)	1.50
Manganese, pure 98@99% N. Y.	75c.
Manganese—Copper (30%@70%) N.Y.	45c.
Molybdenum (98@99%, N. Y.)	$1.75
Phosphorus, foreign red (f. o. b. N.Y.)	90c.
Phosphorus, American yellow (f.o.b. Niagara Falls)	42c.
Tungsten (best) pound lots	1.10
Ferro-Silicon (50%) spot. Ex ship Atlantic ports	$98@100 ton.

Variations in price depend chiefly on size and conditions of orders.

Missouri Ore Market

JOPLIN, Jan. 5

The highest price reported paid for zinc was $50 per ton, on an assay basis of $47 per ton, the basis ranging down to $44 for inferior ores. The average price, all grades, was $45.60, a general advance of $1.04 per ton.

The highest price reported paid for lead was $86.84 per ton, prices generally being as strong, with an average price of $82.98 per ton.

The shipment of the week was 1650 tons of zinc and 197 tons of lead larger than the first week of 1906, and the value is 42 per cent. greater. Although the smelters have 8000 tons of ore purchased lying in the bins throughout the district, which cannot be shipped on account of the car situation, the demand was stronger than for a month, and prices are being made in advance of the output. It is apparent that the smelters are preparing for a storm period, and will have ore to ship even if the output may be curtailed, without forcing an unnatural price upon the commodity.

Following are the shipments of zinc and lead from the various camps of the district for the week ending today:

	Zinc, lb.	Lead, lb.	Value.
Webb City-Carterville	2,389,890	761,120	$86,553
Joplin	2,431,830	222,160	66,367
Galena-Empire	1,249,130	116,240	32,929
Alba-Neck	1,273,580	.	30,565
Badger-Peacock	1,130,410	.	27,689
Duenweg	457,880	186,550	18,272
Prosperity	367,450	133,490	13,990
Baxter Springs	425,190	18,970	10,131
Aurora	424,950	20,590	9,450
Granby	340,000	76,000	7,700
Carthage	230,000		5,520
Spurgeon-Spring City	174,540	47,530	4,794
Oronogo	120,460	12,550	3,375
Springfield	85,670		2 056
Sherwood	4 920	29,300	1,284
Stott City	37 090		853
Zincite	27,590		634
Totals	11,170,580	1,624,500	$322,162

Zinc value, the week, $254,752.
Lead value, the week, 67,410.

Same week last year	7,871,130	1,230,020	$226,525

The following table shows the average monthly prices of zinc and lead ores in Joplin, by months; the average for zinc being based on the prices of assay basis ores carrying 60 per cent. zinc.

ZINC ORE AT JOPLIN.			LEAD ORE AT JOPLIN.		
Month.	1905.	1906.	Month.	1905.	1906.
January	52.00	47.38	January	61.50	75.20
February	52.77	47.37	February	57.62	72.83
March	47.40	42.68	March	57.20	73.73
April	42.88	44.63	April	58.00	75.13
May	43.31	40.51	May	58.27	78.40
June	40.75	43.83	June	57.80	80.96
July	43.00	43.25	July	58.00	74.31
August	48.83	43.56	August	58.00	75.36
September	46.75	42.58	September	63.50	79.64
October	47.60	41.55	October	63.86	79.84
November	49.55	44.13	November	68.67	81.98
December	49.00	43.68	December	76.25	81.89
Year	44.88	43.24	Year	62.12	77.40

Wisconsin Ore Market

PLATTEVILLE, Jan. 5

The first week of the year shows a feeling of confidence among producers and buyers alike. Had there been plenty of cars, it is safe to say that nearly all of the ore in the bins would have been cleaned up. Several of the larger producers have been closed down for the holidays, which will curtail the output somewhat. The new producer at Big Patch camp has a carload of ore ready which will probably be sold without roasting, as the price offered is said to be above the usual for the same grade of unroasted ore. It is confidently expected that the price of 60 per cent. zinc ore will take a slight jump upward this month. The reason for this is that it is thought the closing down of one or two of the producers for a part of the winter will limit the output to a certain degree. Sixty per cent. zinc ore sold from $45 to $48, only a few buyers being out. A choice lot of lead at Cuba City is reported as having been sold at $90 per ton. Dry-bone and sulphur remain same as last week.

The different camps of the district loaded ore for the week ending Jan. 5, 1907, as follows:

Camps.	Zinc, Lb.	Lead, Lb.	Sulphur Lb.
Highland	193,800	.....	.....
Linden	165,260	.....	.....
Cuba City	144,200	.....	.....
Benton	96,450	60,000	.....
Harker	74,930	.....	.....
Galena	74,600	.....	.....
Livingston	43,000	.....	.....
Total for week	792,240	60,000	.....

An event of interest to the producing local zinc centers was the starting of the new concentrating plant at Hazel Green, on the Murphy property. The new station at Hazel Green will in the future be reported direct, as the railroad has permanently installed an agent for the zinc producers. Shipments are still held down owing to lack of cars.

Chemicals

NEW YORK, Jan. 9

Copper Sulphate—The market is firm, with a strong demand. Prices are unchanged, carload lots selling for $7.25 per 100 lb., while $7.50 is asked for smaller parcels.

Exports of copper sulphate from the United States for the 11 months ending Nov. 30 were 18,607,387 lb. in 1905, and 18,702,607 lb. in 1906; an increase of 95,220 lb. last year.

Nitrate of Soda—Messrs. Mortimer & Wisner, of New York, give the following statistics of nitrate for the United States, as of date Jan. 1, 1907, in long tons:

	1905.	1906.	Changes.
Stocks, Jan. 1	8,380	13,100	I. 4,720
Imports, 12 months	270,300	322,780	I. 52,480
Total supplies	278,680	335,880	I. 57,200
Deliveries, 12 months	265,580	322,830	I. 57,280
Stocks, Dec. 31	13,100	13,050	D. 50
Afloat for U. S.	100,000	80,000	D. 20,000

The tonnage afloat includes all cargoes reported which are due to arrive by April 15 next.

There is nothing new to report in the nitrate market this week. Prices remain unchanged at $2.25@2.60 for spot delivery with futures selling 10c. lower.

Heavy Chemicals—Imports of heavy chemicals into the United States for the 11 months ending Nov. 30 were, in pounds:

	1905.	1906.	Changes.
Bleaching powder	96,091,274	96,321,476	I. 230,202
Potash salts	258,191,447	280,929,332	I. 22,737,885
Soda salts	26,679,175	20,399,360	D. 6,279,815

Exports of acetate of lime for the 11 months were 62,878,143 lb. in 1905, and 65,648,296 lb. in 1906; an increase of 2,770,153 lb. last year.

Phosphates—Exports of phosphates from the United States for the 11 months ending Nov. 30 were, in long tons:

	1905.	1906	Changes.
Crude	865,542	871,428	I 5,886
All other	21,596	29,488	I. 7,892
Total	887,138	900 916	I. 13.778

The large exports in 1906 were 268,356 tons to Germany, 141,015 tons to Great Britain, 110,257 tons to France, 89,967 tons to Italy.

Sulphur—Imports of sulphur and pyrites into the United States for the 11 months ending Nov. 30 were, in long tons:

	1905.	1906.	Changes.
Sulphur	75,877	69.232	D. 6,645
Pyrites	466,424	515,692	I. 49,268

Estimating sulphur contents of pyrites at the usual figure, the total sulphur imported was 262,467 tons in 1905, and 275,509 tons in 1906; an increase of 13,042 tons last year.

Mining Stocks

NEW YORK, Jan. 5

The year opens with the stock markets still uncertain, and inclined to be heavy. Buyers seem to be hesitating, while the period of liquidation is not yet at an end. Notwithstanding the general prosperity, there are signs that the issue of new securities has been greater than can be readily absorbed, and this weighs upon the market as a whole.

The better class of mining stocks has followed the course of the general market, the exception being found in the copper stocks. Unfortunately, there is activity in the doubtful class, and in the lower class, which is not at all doubtful, but altogether worthless. These are pushed for sale among people who know nothing of mining, and have no means of finding out their real standing, but who like to speculate in a small way, and who listen to the tempting offers of promoters.

The copper stocks are exceptionally active, as is shown by the Boston market.

Boston Jan. 8

The Boston market has been like a seething caldron the past week. The new year opened auspiciously and the pace set has been something killing. Never in the annals of the Boston Stock Exchange has business reached the volume that it did last week. Friday was a record-breaking day, with sales of over 219,000 shares, and of this 74,000 was Trinity alone, which is the record for any single stock in a day's session of the exchange. The public is in this stock as never before, thanks to newspaper advertising by Lawson. The final sale for 1906 was $20.50. In the meantime it has sold at $40, almost a 100 per cent. rise in three days, broke to $26 the same day, recovered to $37, and closed tonight at $31.50. Thursday it rose from $32 to $39.87½. Stock-exchange houses have been flooded by out-of-town investors and people had become Trinity crazy. Fortunately things have quieted down. This is due to the fact that brokers were requiring cash for all Trinity trades.

Of course other mining stocks have soared, but not to the same extent. Allouez touched $70.50 today, which compares with $54.50 Dec. 31. Centennial rose $5 to $43, both reacting substantially. Osceola rose $11 to $165, receiving a $6 setback. There is no doubt there is a combination forming, having these three stocks as a nucleus. Amalgamated sold up $6.12½ to $121, reacting to $118.50 tonight. North Butte made a record price at $120, up $8.62½, and Tamarack is up $15.50 to $132. Quincy touched $116 and Wolverine $190. Tennessee Copper forged $5.25 ahead to $55.25, and Shannon made its best price today at $21. Rhode Island rose $2.87½ to $11.37½, reacting $1, and Santa Fe spurted $2.87½ to $7.37½. Wyandot is being picked up and has risen from $2.62½ to $3.12½.

Utah Consolidated sold up $4 to $67, reacting slightly, and United States Smelting rose $4.37½ to $70, closing at $67. The preferred sold up to $49. United States Smelting directors have declared an initial dividend on the common stock, making the first payment in April at the rate of 7 per cent., the same as paid on the preferred. Calumet & Arizona was strong on talk of an increase in the dividend. Davis-Daly has been the curb feature, selling up $3 to $19. Curb dealings are keeping pace with those on the stock exchange.

Colorado Springs Jan. 4

The holiday inactivity is still prevalent on the local stock exchange. The prices have held up fairly well, but the trading has been dull during the entire week. Work has been the most active trader on the list, with 26,500 shares to its credit, selling from 22½ on Monday, down to 20 Friday. The other active traders were Elkton, El Paso and Isabella, all of them showing a decline today from the prices earlier in the week. The mine-owners' committee in charge of the proposed drainage tunnel for the Cripple Creek district have decided on the intermediate tunnel, on which work is expected to begin Jan. 15. The tunnel will be 27,190 ft. in length. The main water course will be reached 15,550 ft. in.

Mexico Dec. 31

Mexican mining stocks during the week showed considerable animation, particularly due to Cinco Senores, a rumored rich strike in said property causing its stock to jump from $45 to $140. Other stocks, with their respective raises, were as follows: State of Guanajuato, Angustias, $114@145; Roma, $41@61; Faro, $7. State of San Luis Potosi, Santa Maria de La Paz, $240@255; Barreno, $270. El Oro district, Aldebaran, $160; Borda Antigua, $100@115; Germania, $190; Rosario, $55. In Pachuca, Amistad y Concordia, $107; Soledad, $1610; Sorpresa, $515 per share.

Monthly Average Prices of Metals

AVERAGE PRICE OF SILVER

Month.	New York.		London.	
	1905.	1906.	1905.	1906.
January	60.690	65.288	27.930	30.113
February	61.023	66.108	28.047	30.464
March	58.046	64.597	26.794	29.854
April	56.600	64.765	26.108	29.964
May	57.832	66.976	26.664	30.968
June	58.428	65.394	26.910	30.185
July	58.915	65.105	27.163	30.113
August	60.259	65.949	27.822	30.529
September	61.695	67.927	28.528	31.483
October	62.034	69.523	28.637	32.148
November	63.849	70.813	29.493	32 671
December	64.850	69.060	29.977	32.003
Year	60.352	66.791	27.889	30.868

The New York prices are in cents per fine ounce; the London quotation is in pence per standard ounce, 0.925 fine.

AVERAGE PRICES OF COPPER

	NEW YORK.				LONDON.	
	Electrolytic.		Lake.			
	1905.	1906.	1905.	1906.	1905.	1906.
Jan.	15.008	18.310	15.128	18.419	68.262	78.869
Feb.	15.011	17.869	15.136	18.116	67.963	78.147
March.	15.125	18.361	15.250	18.641	68.174	81.111
April.	14.920	18.375	15.045	18.688	67.017	84.793
May	14.627	18.457	14.820	18.724	64.878	84.867
June.	14.673	18.442	14.813	18.719	65.881	83.994
July.	14.888	18.190	15.005	18.585	66.887	81.167
Aug.	15.664	18.380	15.725	18.706	69.830	83.864
Sept.	15.965	19.033	15.978	19.328	69.667	87.831
Oct.	16.279	21.203	16.332	21.722	71.406	97.369
Nov.	16.599	21.833	16.758	22.398	74.727	100.270
Dec.	18.328	22.885	18.398	23.350	78.993	105.226
Year.	15.590	19.278	15.699	19.616	69.465	87.282

New York prices are in cents per pound. Electrolytic quotations are for cakes, ingots or wire bars. The London prices are in pounds sterling, per long ton of 2240 lb., standard copper.

AVERAGE PRICE OF TIN AT NEW YORK

Month.	1905.	1906.	Month.	1905.	1906.
Jan.	29.325	36.390	July	31.760	37.275
Feb.	29.262	36.403	August	32.866	40.606
March.	29.523	36.662	Sept	32.095	40.516
April.	30.525	38.900	Oct	32.481	42.852
May.	30.049	43.313	Nov.	33.443	42.906
June.	30.329	39.260	Dec.	35.835	42.750
			Av. year.	31.358	39.819

Prices are in cents per pound.

AVERAGE PRICE OF LEAD, NEW YORK

Month.	1905.	1906.	Month.	1905.	1906.
Jan.	4.552	5.600	July	4.524	5.750
Feb.	4.450	5.464	Aug.	4.665	5.750
March.	4.470	5.350	Sept.	4.850	5.750
April.	4.500	5.404	Oct.	4.850	5.750
May.	4.500	5.685	Nov.	5.200	5.750
June.	4.500	5.750	Dec.	5.422	5.900
			Av., year.	4.707	5.347

Prces are in cents per pound. The London average for January, 1906, was £16.850 per long ton; February, £16.031; March, £15.922; April, £15.959; May, £16.725; June, £16.813; July, £16.525; August, £17.109; September, £18.266; October, £19.350; November, £19.281; December, £19.609; year, £17.370

AVERAGE PRICE OF SPELTER

Month.	New York.		St. Louis.		London.	
	1905.	1906.	1905.	1906.	1905.	1906.
Jan.	6.190	6.487	6.032	6.337	25.062	28.225
Feb.	6.139	6.075	5.989	5.924	24. 594	25.844
Mar.	6.067	6.209	5.917	6.056	23.825	24.563
April.	5.817	6.078	5.667	5.931	23.813	25.781
May.	5.434	5.997	5.284	5.846	23.594	27.000
June.	5.190	6.096	5.040	5.948	23.875	27.728
July.	5.396	6.006	5.247	5.856	23.938	26.800
Aug.	5.706	6.027	5.556	5.878	24.675	26.938
Sept.	5.887	6.216	5.737	6.056	26.375	27.563
Oct.	6.087	6.222	5.934	6 070	28.225	28.075
Nov.	6.145	6.375	5.984	6.225	28.500	27.781
Dec.	6.522	6.593	6.374	6.443	28.719	27.938
Year.	5.822	6.198	5.730	6.048	25.433	27 020

New York and St. Louis prices are in cents per pound. The London prices are in pounds sterling per long ton (2240 lb.) good ordinary brands.

STOCK QUOTATIONS

NEW YORK — Week Jan. 5

Name of Company.	High.	Low.	Clg.	Sales.
Alaska Mine	1⅞	1½	1⅝	8,700
Am. Nev. M. & P. Co.	3⅜	3¼	3⅜	200
Amalgamated	121¼	113⅝	120⅝	459,800
Anaconda	291¼	283¼	288	88,400
Balakala	15	11	15	2 100
British Col. Copper	14⅝	12½	14½	13,500
Buffalo Cobalt	....	....	4⅛	....
Butte & London	....	....	2½	....
Butte Coalition	39½	35½	38⅛	6,100
Butte Copper & Zinc	5⅞	5⅝	6	1,250
Cobalt Contact	⅝	⅝	⅝	5,000
Colonial Silver	3⅞	3½	3½	5,300
Cum. Ely Mining	13½	12¾	13½	7,900
Davis Daly	18⅝	15	18⅜	19,480
Dominion Cop	7⅜	6¾	7⅜	18,000
El Rayo	7⅛	6¾	7⅛	3,600
Foster Cobalt	3	2	2⅞	6,100
Furnace Creek	3¼	2⅜	3	20,880
Giroux Mine	10	9⅜	10	3,720
Gold Hill	4½	3½	4¼	6,900
Greene Gold	2¼	2	2	7,650
Greene Gold & Silver	2	1⅞	2	27,500
Greenwater & D. Val	2¾	2¼	2½	200
Guanajuato	4¾	4¾	4¾	200
Guggen. Exp	....	....	290	....
Hanapah	....	....	⅜	....
McKinley Darragh	2½	1⅞	2⅜	28,700
Micmac	7⅛	6½	7	14,600
Mines Co. of Am	2⅜	2⅛	2⅛	14 800
Mitchell Mining	6	5½	5⅞	4,680
Mont. Sho. Con. (New)	14	13	14	825
Nev. Utah M. & S.	4½	3⅞	4⅜	12,400
Newhouse M. & S.	17⅜	15½	17⅜	2,445
Nipissing Mines	15¼	10¾	14⅜	154,500
Old Hundred	4¼	3½	4¼	30,350
Richmond Eureka	....	....	7⅜	....
Silver Queen	2¼	1⅞	2¼	14,300
Stewart	3	2⅜	2⅜	10,100
Tennessee Copper	51	47½	51	8,970
Union Copper	⅞	⅞	⅞	400
Utah Apex	....	....	7	....
West Columbus	19	17	17½	3 600

NEW YORK INDUSTRIAL

Am. Agri. Chem	25	24	25	400
Am. Smelting & Ref	154½	148¼	153⅞	61,700
Am. Smelt. & Ref., Pf.	116⅜	114⅜	116	1,620
Bethlehem Steel	19	18½	19	200
Colo. Fuel & Iron	55⅝	51½	55⅛	27,900
Federal M. & S., Pf	96	94¾	96	1,600
Inter. Salt	20	19	19	127
National Lead	75½	72	75	4,431
National Lead, Pf	103	102½	103	450
Pittsburg Coal	16¾	15⅞	16½	400
Republic I. & S.	41	37¾	40¾	16,600
Republic I. & S., Pf	99	96⅞	99	3,100
Sloss-Sheffield	77	74	76¾	2,800
Standard Oil	530	520	526	136
Tenn. C. & I.	162	160	161½	400
U. S. Red. & Ref.	27½	27⅜	27½	100
U. S. Steel	50	47¼	49¾	224,040
U. S. Steel, Pf	106½	104	106½	28,520
Va. Car. Chem	39	38	38½	1,600
Va. I. Coal & Coke	84½	77	83	2,300

PHILADELPHIA — Jan. 5.

Name of Company.	High.	Low.	Clg.	Sales.
American Cement	10⅜	10	10⅛	291
Cambria Steel	44½	37⅝	43¾	48,067
General Asphalt	7	7	7	5
Penn. Steel, pd.	104½	104½	104½	40
Philadelphia Co.	48	48	48	547
Tonopah Mining	19⅝	19	19⅛	1,565

PITTSBURG — Jan. 5

Crucible Steel	12¼	11⅜	12¼	1,052
Crucible Steel, Pf.	79	78	79	109
Harbison-Walker Ref.	....	....	13½	....
Ohio Tonopah	16	16	16	1,400
Tonopah Ext.	6¼	5¾	5¾	225

St. Louis — Jan. 5

Adams, $0.40—$0.20; American Nettie, -0.08—$0.06; Center Creek, $2.60—$2.25; Central Coal and Coke, $63.00—$62.50; Central Coal and Coke, pfd., $80.00—$78.00; Central Oil, $60.00—$63.00; Columbia, $4.00—$3.90; Con. Coal, $24.00—$22.00; Doe Run, $150.00—$140.00; Granite Bimetallic, $0.40—$0.37; St. Joe, $19.00—$18.00.

COLORADO SPRINGS — Jan. 5

Name of Company.	High	Low	Clg	Sales
Acacia	13⅞	13⅜	13½	4,000
Black Bell	4½	4¼	4½	2,000
C. C. Con	....	....	....	....
C. K. & N.	16¾	16	16	4,000
Doctor Jack Pot	8½	8¼	8¼	3,500
Elkton	66	59½	60	14,000
El Paso	62	60	60¾	14,600
Findley	70¾	70	70¾	18,700
Gold Dollar	8¼	8	8	3,000
Gold Sovereign	....	....	....	....
Isabella	28	27	27½	13,000
Jennie Sample	....	....	....	....
Mary McKinney	75	71¾	73	2,625
Pharmacist	6¾	6½	6¾	2,000
Portland	1.42½	1.37	1.37	5,500
Vindicator	99	97	99	600
Work	22½	20	20¼	26,500
United Gold Mines	10	9¾	9½	7,200

BOSTON — Jan. 5

Adventure‡	6⅛	5	5⅛	15,610
Allouez	69	52½	64¾	11,951
Am. Zinc†	45	43	44¼	1,897
Arcadian	14¼	10	13⅝	66,033
Atlantic	16	14	16	3,565
Bingham	35½	31	34¼	11,225
Boston Consolidated	33¾	30	33	7,560
Calumet & Arizona	179	175	179	1,794
Calumet & Hecla	900	885	900	135
Centennial	....	....	38	....
Con. Mercur	.50	.45	.47	2,230
Copper Range	88	83½	87	16,840
Daly-West	19¾	18⅞	19⅜	2,030
Franklin	27½	24	26¾	9,854
Granby*	13¾	13¾	13¾	100
Greene Consolidated	33¾	31⅞	33	26,121
Isle Royal	32	26½	29	13,488
Mass	8½	8	8¼	1,895
Michigan	23	20¾	22¼	6,313
Mohawk*	85	80½	85	3,889
Mont. Coal&Coke new.	1⅞	1¾	1¾	800
Nevada	19¾	18	19	1,425
North Butte	120	110½	119	31,108
Old Colony	2½	2⅜	2½	1,460
Old Dominion	57¾	53	57	4,080
Osceola*	165	147	161	3,516
Parrot	34	28¼	32	4,238
Phoenix	1¼	1	1	1,574
Quincy†	118	110	115	4,610
Rhode Island	11½	8¼	11	38,137
Santa Fe	5¾	4⅜	5⅛	13,477
Shannon	20	18	19¼	26,021
Tamarack*	125	114	125	1,255
Tecumseh	31	27½	31	2,011
Trinity	41	18⅜	31¾	215,764
United Copper, com	75¼	73⅜	74⅝	2,425
U. S. Oil	11⅜	10	11	6,350
U. S. Smg. & Ref.	70	63	68½	22,155
U. S. Sm. & Ref., pfd.*	47⅛	45¼	47	7,658
Utah Copper*	67	62	66¾	9,313
Victoria	7¾	7¼	7½	1,805
Washington	2¼	2	2	60
Winona‡	13	11¾	13	5,803
Wolverine	190	188	190	231
Wyandotte	2¾	2¼	2½	2,298

*Ex. Div. †Ex. Rights. ‡Ass. Paid.

BOSTON CURB.

Ahmeek	110½	100	106	968
Ariz. Com'l	36	34	34	467
Black Mt	10¾	9½	10⅜	1,075
Cananea Cent	32¾	31	32	2,858
East Butte	13¾	12½	13	4.315
Hancock Con	16½	15¾	16½	1,205
Keweenaw	13¾	12¾	13	2,725
Majestic	3⅞	3⅝	3⅝	3,711
Raven	1⅜	.96	.99	13,425
Shawmut	1⅛	.95	1⅛	6,200
Superior	20	18	18	160
Superior & Pitts	27¾	26	27	12,205
Troy	3⅓	3	3	870

NEVADA MINING STOCKS — Jan. 9
(Revised by Weir Bros. & Co., New York)

	High.	Low.	Last.
TONOPAH STOCKS.			
Tonopah Mine of Nevada	19.37	19.12	19.25
Tonopah Extension	5.75	5.50	5.62½
Montana Tonopah	4.00	3.95	4.00
Belmont	5.75	5.62½	5.75
Tonopah Midway	2.36	2.34	2.33
West End Con	1.95	1.90	1.90
Jim Butler	1.30	1.29	1.30
GOLDFIELD STOCKS.			
Sandstorm	.70	.68	.69
Kendall	.60	.58	.60
Red Top	4.12½	4.00	4.12½
Jumbo	4.12½	4.00	4.12½
Goldfield Mining	1.55	1.52	1.53
Diamondfield B. B. Con	.56	.55	.55
Atlanta	.83	.82	.83
Mohawk	15.75	15.25	15.30
Silver Pick	1.50	1.50	1.50
Laguna	1.40	1.37	1.40
BULLFROG STOCKS.			
Montgomery Shoshone Con.	14.00	13.00	13.50
Tramps Con	1.74	1.72	1.73
Gold Bar	1.43	1.42	1.42
Bullfrog Mining	.42	.41	.41
Bullfrog National Bank	.56	.54	.55
Homestake Con	1.36	1.20	1.25
MANHATTAN STOCKS.			
Manhattan Con	1.00	.95	.98
Manhattan Dexter	.76	.74	.75
Jumping Jack	....	....	....
Stray Dog	....	....	....
Indian Camp	....	....	....

LONDON. *(By Cable.*)* Jan. 9.

Dolores, £1 6s. 3d.; Stratton's Independence, £0 3s. 6d.; Camp Bird, £1 8s. 3d.; Esperanza, £2 16s. 3d.; Tomboy, £1 11s. 3d.; El Oro, £1 6s. 3d.; Oroville, £1 1s. 0d.; Somera, £0 6s. 3d.; Utah Apex, £1 11s. 3d.; Arizona Copper, pref., £3 15s.; Ariz. Copper, def., £3 12s. 6d.

*Furnished by Hayden, Stone & Co., New York.

SAN FRANCISCO — Jan. 2

Name of Company.	High.	Low.	Clg.	Sales.
COMSTOCK STOCKS.				
Belcher	.91	.56	.91	9,400
Best & Belcher	1.45	1.45	1.45	300
Caledonia	.55	.46	.48	3,500
Challar	.22	.19	.22	4,200
Con. Cal. & Va	1.25	1.20	1.20	1,900
Crown Point	.32	.27	.32	6,400
Gould & Curry	.41	.36	.38	3,750
Hale & Norcross	1.05	1.05	1.05	300
Mexican	.96	.90	.92	1,700
Ophir	3.30	3.25	3.30	1,900
Overman	.25	.23	.25	2,400
Potosi	.15	.14	.14	1,700
Savage	1.20	1.15	1.15	400
Sierra Nevada	.80	.75	.79	3,600
Yellow Jacket	1.80	1.55	1.60	3,900
TONOPAH STOCKS.				
Belmont	....	....	5.50	....
Golden Anchor	.46	.43	.45	6,000
Jim Butler	1.35	1.25	1.25	12,500
McNamara	.72	.62	.62	8,100
Midway	2.35	2.30	2.35	1,200
North Star	.43	.41	.43	6,600
West End	2.00	1.92	2.00	5,300
GOLDFIELD STOCKS.				
Atlanta	.71	.59	.69	76,300
Columbia Mt	1.20	1.07	1.10	17,400
Comb. Frac	3.70	3.50	3.65	20,700
Diamondfi'd B.B. Con.	.53	.48	.52	35,184
Florence	....	....	4.00	....
Frances-Mohawk	.95	.80	.90	1,600
Goldfield Mining	....	....	1.50	....
Jumbo	3.55	3.50	3.50	300
Kendall	.58	.55	.55	2,100
Laguna	.50	.50	.50	100
Mohawk	13.75	13.50	13.75	800
Red Top	3.50	3.45	3.50	200
Silver Pick	1.45	1.17	1.30	58,950
Sandstorm	.72	.69	.70	5,200
BULLFROG STOCKS.				
Bullfrog Mining	....	....	.44	....
Bullfrog Nat'l Bank	.62	.56	.57	11,100
Gold Bar	1.50	1.35	1.40	14,400
Homestake Con	1.35	1.30	1.35	6,000
Original	.52	.19	.52	15,300
Tramps Con	1.80	1.72	1.75	11,800
MANHATTAN STOCKS.				
Indian Camp	1.15	1.05	1.15	63,900
Jumping Jack	.53	.50	.51	84,150
Manhattan Con	1.07	1.02	1.02	5,750
Manhattan Dexter	.79	.72	.84	13,000
Stray Dog	.78	.70	.76	61,275

New Dividends

Company.	Payable.	Rate.	Amt.
Am. Smelting & Ref.	Jan. 15	$1.75	$875,000
American Cement Co.	Jan. 24	0.40	80,000
Anaconda Copper	.....	1.75	2,100,000
Bunker Hill & Sullivan	Jan. 4	0.60	780,000
Central Coal & Coke	Jan. 15	1.50	76,875
Central C. & I., pfd.	Jan. 15	1.25	23,438
Columbus Con., Utah	Jan. 6	0.15	45,000
Daly Judge, Utah	Jan. 12	0.37½	112,500
Esperanza	Jan. 21	2.52	1,146,600
International Nickel, pfd.	Feb. 1	1.50	133,659
Mohawk Copper	Jan. 10	4.00	400,000
National Lead	Jan. 15	1.00	149,054
Nipissing Mines	Jan. 20	0.25	360,000
Osceola, Mich.	Jan. 24	6.00	600,000
Standard Con., Cal.	Dec. 24	0.10	17,839
Tamarack, Mich.	Jan. 24	3.00	300,000
Tennessee C., I. & R. R.	Feb. 1	1.00	225,536
Tennessee C., I. & R. R., pfd	Feb. 1	2.00	4,960
Tennessee Copper	Jan. 12	1.25	218,750
Teziutlan Copper	Jan. 2	2.00	20,000
Tonopah of Nevada	Jan. 21	0.35	350,000
United Zinc, pfd.	Jan. 15	0.50	9,778
Utah Con., Utah	Jan. 15	3.00	900,000
Va-Carolina Chem., pf.	Jan. 15	2.00	360,000
Vulcan Detinning, pfd.	Jan. 19	1.25	18,750

Assessments

Company.	Delinq.	Sale.	Amt.
Butte Lode, Cal.	Dec. 22	Jan. 22	$4.50
Champ'n Mines, Cal.	Jan. 21	Feb. 9	0.50
Golden Gate, Cal.	Jan. 7	Feb. 6	0.01
Gould & Curry, Nev.	Dec. 10	Dec. 31	0.10
Great Ironclad, Cal.	Dec. 24	Jan. 15	0.03
Lyon, Utah	Dec. 10	Jan. 2	0.01
Mexican, Nev.	Jan. 10	Jan. 31	0.15
Naildriver, Utah	Dec. 24	Jan. 10	0.05
Potosi, Nev.	Jan. 7	Jan. 29	0.10
Red Cloud, Idaho	Dec. 15	Jan. 15	0.001
Star Con., Utah	Dec. 20	Jan. 9	0.03
Susannah, Utah	Dec. 21	Jan. 10	0.00½
Vicksburg, Utah	Jan. 9	Jan. 21	0.01
West'nMinesCo., Nv.	Dec. 24	Jan. 24	0.02
Yellow Jacket	Dec. 17	Jan. 27	0.15

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.

ABRASIVES—		
Bort, good drill quality, carat		$85.00
Carborundum, f.o.b. Niagara Falls, powd.	lb.	.08
Grains	"	.10@.17
Corundum	"	.07@.10
Crushed Steel, f.o.b. Pittsburg	"	.05¾@.06
Emery, in kegs: Turkish flour	"	.01½@.02½
Grains	"	.03½@.04½
Naxos flour	"	.01½@.02½
Grains	"	.03½@.04½
Chester flour	"	.01½
Grains	"	.03½@.04½
Peekskill, f.o.b. Easton, Pa., flour	"	.01½@.01½
Grains, in kegs	"	.02@.02½
Garnet, per quality	sh. ton	25.00@35.00
PumiceStone, Am. Powd.	100 lb.	1.60@2.00
Italian, powdered	"	.01¼@.01½
Lump, per quality	"	.03@.20
Rottenstone, ground	"	.02½@.03½
Lump, per quality	"	.05@.25
Rouge, per quality	"	.06@.30
Steel Emery, f.o.b. Pittsburg	"	.07½@.07¾
ACIDS—		
Acetic 28%	lb.	.02½
Boric	"	.10@.11
Hydrofluoric, 30%	"	.02¾@.03
" 48%	"	.06
" 60%	"	.10@.10½
Hydrochloric acid, 20°	per lb.	1.25@1.50
Nitric acid, 38°	per lb.	4.25@4.62½c.
Sulphuric acid, 50°, bulk, per ton		$12 up.
60°, 100 lb. in carboys		.90@1.12½
60°, bulk, ton		17.00@18.00
66°, 100 lb. in carboys		1.00@1.25
66°, bulk, ton		18.50@20.00
Oxalic	"	.08¼@.08½
ALCOHOL—Grain	gal.	2.46¼
Refined wood, 95@97%	"	.70@.75
ALUM—Lump	100 lb.	$1.75
Ground	"	1.85
Chrome Alum	lb.	.03¼@.03¾
ALUMINUM—Sulphate, com'l.	"	1.25@1.60
AMMONIA—24 deg.	lb.	.04¾@.05½
" 26 "	"	.05@.05¾
AMMONIUM—		
Bromide	lb.	.23
Carbonate	"	.07½@.08½
Muriate grain	"	.06½
Lump	"	.09½@.09¾
Sulphate, 100 lb		3.10@3.15
Sulphocyanide com	"	.30
" " chem. pure	"	.40
ANTIMONY—needle, lb		.17@.18
ARSENIC—White (nominal)	"	.07½@.07¾
Red	"	.06¼@.06¾
ASPHALTUM—		
Barbadoes	per ton.	40.00@80.00
West Indies	"	20.00@60.00
Egyptian	lb.	.06@.07
Gilsonite, Utah ordinary	per ton.	50.00
Trinidad	"	30.00@40.00
California	"	20.00@30.00
BARIUM—		
Carb. Lump, 80@90%	sh. ton.	30.00@35.00
Powdered 80@90%	lb.	.02@.02½
Chloride com'l	ton.	34.00
Nitrate, powdered, in casks	lb.	.06
Sulphate (Blanc Fixe)	"	.02¼
BARYTES—		
Am. Ground	sh. ton.	14.00@21.00
Floated	"	15.00@21.00
Foreign floated	"	19.50@21.00
White	"	21.00
BISMUTH—Sub-nitrate	lb.	1.50
BLEACHING POWDER—35%, 100 lb.		1.30@1.50
BLUE VITRIOL—(copper sulphate), carload, per 100 lb		7.25
BONE ASH	lb.	.02½@.03
BORAX	"	.07½@.08
CALCIUM—Acetate, gray	"	2.35@2.40
Acetate, brown	"	1.60@1.65
Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jersey City, N. J.	sh. ton.	65.00
Chloride, f.o.b. N. Y.	"	13.00@15.00
CEMENT—		
Portland, Am. 500 lb.	bbl.	1.55@1.60
Foreign	"	2.25@2.50
"Rosendale," 300 lb.	"	.85
(in sacks)		.65
Slag cement	"	.75@1.25
CHROME ORE—		
New Caledonia 50% ex. ship N. Y.	per lg. ton	17.00@19.75
Bricks, f.o.b. Pittsburg, M.	"	175.00
CLAY, CHINA—Am. common ex-dock, N. Y.	"	8.00 up.
Foreign	"	11.00@18.00
COBALT—Oxide	lb.	2.50
COPPERAS—Bulk	100 lb.	$0.55
In bbls	"	.65@.75
In bags	"	.60@.70
CRYOLITE	lb.	.06½
FELDSPAR—Ground best	sh. ton.	12.00@15.00
FIRE BRICK.		
American	per M.	30.00@40.00
Imported	"	35.00@45.00
St. Louis No. 1	"	16.00
" No. 2	"	14.00
Extra	"	20.00@23.00
FIRE CLAY.		
St. Louis mill	per ton	2.50
FLUORSPAR—		
Domestic f.o.b. shipping port:		
Lump	sh. ton.	8.00@10.00
Ground	"	11.50@13.50
Gravel	"	4.25@4.50
Foreign crude ex. dock		8.00@10.00
FULLER'S EARTH—Lump	100 lb.	.80@.85
Powdered	"	.80@1.25
GRAPHITE—		
American, ore, common	lb.	.01@.10
Artificial	"	.06
Ceylon, common pulv	"	.02½@.03½
Best, pulverized	"	.04@.06
German, com. pulv	"	.01½@.01½
Best, pulverized	"	.01½@.02
Italian, pulverized	"	.01@.02
GYPSUM—		
Fertilizer	"	7.00
Rock	lg. ton.	4.00
INFUSORIAL EARTH—		
Ground Am. best	lb.	.01¾
French	lg. ton.	56.00
German	lb.	.02½@.02¾
LEAD—Acetate (sugar of)	lb.	.07½
Nitrate, com'l	"	.08½@.09
MAGNESITE—Greece.		
Crude (95%)	lg. ton.	7.00@8.00
Calcined	sh. ton.	30.00@35.00
Bricks, domes, per qual. f.o.b. Pittsburg	M.	160@200
MAGNESIUM—		
Chloride, com'l	100 lb.	.90@1.25
Sulphate (Epsom salt)	100 lb.	.90@1.25
MANGANESE—		
Crude powdered:		
70@75% binoxide	lb.	.02
75@85% binoxide	"	.02½
85@90% binoxide	"	.04
90@95% binoxide	"	.05½
Ore, 80%-85%	sh. ton.	27.00@35.00
MARBLE—Flour	sh. ton.	8.00@8.50
MINERAL WOOL—		
Slag, ordinary	"	19.00
Selected	"	25.00
Rock, ordinary	"	32.00
Selected	"	40.00
MONAZITE SAND—		
Guar. 97%, with 5% Thorium oxide, nominal	lb.	.08 and up.
NICKEL—		
Oxide, crude, lb. (77%) for fine metal contained		.47
Sulphate, single	lb,	.18@.24
" double	"	.11½@.14
NITRATE OF SODA—100 lb. 96% for 1907		2.50
95% for 1908		2.45
95% for 1909		2.45
96% is 5c higher per 100 lb.		
OZOKERITE—best	lb.	.14@.17
PAINTS AND COLORS—		
Litharge, Am. powdered	"	.07½@.07½
English glassmakers'	"	.08½@.08½
Lithopone	"	.04@.05
Metallic, brown	sh. ton.	19.00
Red	"	16.00
Ocher, Am. common	"	8.50@9.00
Best	"	16.00
Dutch, washed	lb.	.02½@.03
French, washed	"	.01½@.02½
Paris green, pure, bulk	"	.21@.23
Red lead, American	"	.07½@.07½
Foreign	"	.08½@.08½
Turpentine, spirits bbl., per gal.		.70@.71
White lead, Am., dry	lb.	.06½@.06½
American, in oil	"	.07@.07½
Foreign, in oil	"	.09½@.10
Zinc white, Am. extra dry	"	.05½@.05½
Foreign, red seal, dry	"	.07½@.07½
Green seal, dry	"	.07½@.08½
PHOSPHATES—Acid		.65@67½c per unit
*Fla., hard rock		7.50
land pebble 68%		4.50
†Tenn., 78@80%		6.50@7.00
78%		5.50
75%		5.00
68@72%		4.50
‡So. Car. land rock		6.00
" " river rock		....
POTASSIUM—		
Bicarbonate crystal	lb.	$0.7½@.08
Powdered or granulated	"	.08½@.09
Bichromate, Am	"	.08½@.08½
Scotch	"	.11
Bromide	"	.16
Carbonate (80@85%)	"	.03½@.03½
Caustic, ordinary	"	.04½
Elect. (90%)	"	.05½@.05½
Chloride (muriate), 100 lb.		1.90
Chlorate, powdered	"	.09½@.09½
Crystals	"	.09@09½
Cyanide (98@99%)	"	.18@.19
Kainite, long ton, bulk, 8.50; bags, 9.50.		
Permanganate	lb.	.09½@10
Prussiate, yellow	"	.16½@.17
Red	"	.33
Sulphate	100 lb.	2.18½@2.21½
PYRITE—		
Domestic, non-arsenical, furnace size	per unit	11@11½c
Domestic, non-arsenical, fines, per unit		9@10½c.
Imported non-arsenical, furnace size, per unit		.13@.13½
Imported, arsenical, furnace size, per unit		12@12½c.
Imported fines, arsenical, per unit.		8½@9c.
" " non-arsenical, per unit		10½@11c.

Pyrite prices are per unit of sulphur. An allowance of 25c. per ton is made when delivered in lump form.

SALT—N. Y. com. fine 280 lb. bbl.		.72@1.18
N. Y. agricultural	sh. ton.	3@4.40
SALTPETER—Crude	100 lb.	4.25@4.50
Refined, crystals	"	5.25@5.75
SILICA—		
Ground quartz, ord'ry	sh. ton	13.00@15.00
Silex	"	30.00@40.00
Lump Quartz	"	2.50@4.00
Glass sand	"	2.75
SILVER—Nitrate, crystals	oz.	.43½@.45½
SODIUM—		
Acetate	lb.	.04¼@.04½
"Alkali," per 100 lb., 58/48		.80@.87½
Bicarb. soda, per lb		1.20@1.50c.
Soda, caustic, per 100 lb., 76/60		1.80@1.90
" " powdered		.02¾@.03
Salt cake, per 100 lb		.65@.85
Soda, monohydrate, per lb		1½c.
Bichromate	lb.	.06¼@.06½
Bromide	"	.16
Chlorate, com'l	"	.09@.09½
Cyanide, ("100% KCN")	"	.18@.19
Hyposulphite, Am	"	1.40 up
German	"	1.60@1.70
Phosphate	100 lb.	1.90 up
Prussiate	"	.11½@.12
Sal soda, f.o.b. N. Y	100 lb.	.70@.80
Foreign, f.o.b. N. Y.	"	.90
Silicate, com'l	100 lb.	.75@1.00
Sulphate, com'l, (Glauber's salt)	100 lb.	.50@.60
" " calcined		.65@.85
STRONTIUM—Nitrate	lb.	.08¼@.08½
SULPHUR—		
Balt., Phila., N. Y., Boston, lg. ton		22.12½
Louisiana (prime) to New York, Boston or Portland	lg. ton	22.00
To Philadelphia or Baltimore	"	20.50
Roll	100 lb.	1.85@2.15
Flour	" "	2.00@2.40
Flowers, sublimed	" "	2.20@2.60
TERRA ALBA—French & Eng.	100 lb.	.90@1.00
TALC—Domestic	sh. ton.	15.00@20.00
French, best	"	20.00@25.00
Italian, best	"	35.00@40.00
TIN—Bi-chloride, 50%	lb.	.12½ up
Crystals	"	.26 up
Oxide, lb		.44
URANIUM—Oxide	"	3.50
ZINC—Metallic ch. pure	"	.15
Chloride solution, com'l	"	.02½@.04
Chloride, granular	"	.04½@4½
Dust	"	.05½@.06
Sulphate	"	.02½@.02½

*F. o. b. Florida or Georgia ports. †F. o. b. Mt. Pleasant. ‡On vessel Ashley River, S. C.

Note—These quotations are for wholesale lots in New York, unless otherwise specified, and are generally subject to the usual trade discounts. Readers of THE ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.

DIVIDENDS.

Metal and Mining Companies—U. S.

Name of Company and Location.		Authorized Capital	Shares. Issued.	Par Val.	Dividends. Total to Date.	Latest. Date.	Amt.
Alaska Mexican, g.	Al'ka	$1,000,000	180,000	$ 5	$1,482,381	Oct. 1906	$ .30
Alaska Treadwell, g.	Al'ka	5,000,000	200,000	25	9,035,000	Oct. 1906	1.50
Alaska United, g.	Al'ka	1,000,000	180,200	5	216,240	July 1906	0.30
Amalgamated, c.	Mont	155,000,000	1,530,879	100	44,461,272	Nov. 1906	2.00
Am.Sm.&Ref.,com.	U. S.	50,000,000	500,000	100	9,375,000	Jan. 1907	1.75
Am. Sm. & Ref. pf.	U. S.	50,000,000	500,000	100	23,456,553	Jan. 1906	1.75
Am. Smelters, pf. A	U. S.	17,000,000	170,000	100	1,175,000	Dec. 1906	1.50
Am. Smelters. pf. B	U. S.	30,000,000	300,000	100	2,250,000	Dec. 1906	1.25
Anaconda, c.	Mont	30,000,000	1,200,000	25	32,750,000	Jan. 1907	1.75
Annie Laurie, g.	Utah	5,000,000	25,000	100	465,061	July 1905	.50
Arizona, c.	Ariz	3,775,000	3,682,520	.....	6,182,361	Apr. 1906	.05
Atlantic, c.	Mich	2,500,000	100,000	25	990,000	Feb. 1905	.02
B. & H., l. z.	Mo	400,000	400,000	1	40,000	Dec. 1905	.01
Beck Tunnel, g.s.l.	Utah	1,000,000	1,000,000	1	195,000	Dec. 1906	.04
Bingham & N.H., c.g	Utah	2,000,000	226,000	5	22,600	Sept. 1906	.10
Boston & Montana.	Mont	3,750,000	150,000	25	47,875,000	Nov. 1906	12.00
Bull.Beck.&Cham.g	Utah	1,000,000	100,000	10	2,518,400	Oct. 1906	.10
Bunker Hill & Sull.	Ida	3,000,000	300,000	10	8,046,000	Jan. 1907	.60
Bute Coalition, c.s.	Mont	15,000,000	1,000,000	15	800,000	Dec. 1906	.40
Calumet & Arizonac	Ariz	2,500,000	200,000	10	6,000,000	Dec. 1906	4.00
Calumet & Hecla, c.	Mich	2,500,000	100,000	25	98,350,000	Dec. 1906	20.00
Camp Bird, g., s.	Colo	5,500,000	820,000	5	3,382,500	Feb. 1906	.24
Carisa, c.g.	Utah	500,000	500,000	1	55,000	Nov. 1906	.01
Central Eureka, g.	Cal	400,000	398,425	1	778,921	Mar. 1906	.07
Columbus Con. c.	Utah	1,500,000	300,000	5	45,000	Jan. 1907	.15
Combi'tion Co.G'f'd	Nevada	400,000	320,000	1	688,000	Sept. 1906	.15
Con. Mercur, g.	Utah	1,000,000	1,000,000	1	1,205,000	Dec. 1906	.02½
Continental, z. l.	Mo	550,000	22,000	25	286,000	Jan. 1907	.50
Copper Range Con.	Mich	38,500,000	383,781	100	3,791,334	Dec. 1906	2.00
Creede United, g.	Colo	2,000,000	1,625,000	1	214 053	July 1906	.00½
Cripple Creek Con.g	Colo	2,000,000	2,000,000	1	180,000	Mar. 1905	.00½
Daly Judge, g. s. l.	Utah	300,000	300,000	1	112,500	Jan. 1907	.37½
Daly West, g. s. l.	Utah	3,600,000	180,000	20	5,499,000	Dec. 1906	.60
De Lamar, g. s.	Ida	400,000	67,180	5	2,926,370	May 1905	.72
Dillon, g.	Colo	1,250,000	1,250,000	1	21,875	July 1905	.01
Doctor Jack Pot	Colo	3,000,000	3,000,000	1	268,000	July 1906	.00½
Doe Run, l.	Mo	10,000,000	59,062	100	933,010	May 1906	.50
Elkton Con., g.	Colo	3,000,000	2,500,000	1	1,681,960	Sept. 1906	.00½
El Paso, g.	Colo	2,500,000	2,450,000	1	1,022,750	June 1906	.01
Fed. Sm., com.	Idaho	10,000,000	60,000	100	1,748,750	Dec. 1906	5.00
Federal Sm., pf.	Idaho	20,000,000	120,000	100	2,441,250	Dec. 1906	1.75
Findley, g.	Colo	1,250,000	1,250,000	1	325,000	Aug. 1906	.01
Frances-Mohawk, g	Nevada	1,000,000	1,000,000	1	141,000	Dec. 1906	1.10
Gemini-Keystone	Utah	500,000	5,000	100	1,850,000	July 1906	10.00
Gold King Con	Colo	5,750,370	5,750,370	1	1,407,504	May 1905	.01
Gold Sovereign	Colo	2,000,000	2,000,000	1	10,000	Jan. 1905	.00½
Grand Central, g.	Utah	250,000	250,000	1	1,116,250	Dec. 1906	.06
Gwin Mine, Dev., g.	Cal	1,000,000	100,000	10	35,000	Mar. 1906	.25
Hecla, s. l.	Idaho	250,000	1,000,000	0.25	780,000	Sept. 1906	.02
Homestake, g.	S. D.	21,840,000	218,400	100	15,316,150	Dec. 1906	.50
HornSilver,g.s.c.z.l	Utah	10,000,000	400,000	25	5,502,000	Sept. 1906	.05
Inter'l Nickel, pf.	N. Y.	12,000,000	87,415	100	524,490	Feb. 1907	1.50
Iron Silver	Colo	10,000,000	500,000	20	3,900,000	Jan. 1907	.20
Jamison, g.	Cal	3,900,000	390,000	10	247,270	July 1906	.03
Jerry Johnson.	Cal	2,500,000	2,500,000	1	61,700	Apr. 1906	.03
Kendall, g.	Mont	2,500,000	500 000	5	1,035,000	Dec. 1906	.03
Liberty Bell, g. s.	Colo	700,000	130,551	5	110,857	Jan. 1906	.15
Lightner, g.	Cal	125,000	102,255	1	295,694	Aug. 1905	.05
Mammoth, g. s. l.	Utah	10,000,000	400,000	25	2,080,000	Oct. 1906	.05
Mary McKinney, g.	Colo	1,500,000	1,304,252	1	723,509	Oct. 1906	.06
Mohawk, c.	Mich	2,500,000	100,000	25	900,000	Jan. 1907	4.00
Mont. Ore Purch.	Mont	2,500,000	80,833	25	9,437,274	Jan. 1907	15.00
Monument, g.	Colo	300,000	300,000	1	27,124	Apr. 1905	.01
New Century, z., l.	Mo	300,000	300,000	1	211,500	Nov. 1906	.01
New Idria, q.	Cal	500,000	100,000	5	880,000	Jan. 1907	.20
New Jersey, z.	U. S.	10,000,000	100,000	100	8,400,000	Feb. 1906	3.00
North Butte.	Mont	6,000,000	400,000	15	3,400,000	Dec. 1906	2.00
North Star, g.	Cal	2,500,000	250,000	10	1,286,989	Dec. 1906	.40
Northern Light, g.s.	Utah	2,000,000	400,000	5	20,000	Feb. 1904	.05
Old Dominion Cop.	Ariz	7,500,000	281,589	25	280,843	May 1906	.50
Old Gold	Colo	2,101,150	2,101,150	1	10,506	Mar. 1906	.05
Ophir, g. s.	Nevada	302,400	100,800	3	1,797,400	July 1904	.25
Osceola, c.	Mich	2,500,000	96,150	25	6,362,600	Jan. 1907	6.00
Parrot, c,s.	Mont	2,300,000	229,850	10	6,635,262	Dec. 1906	.25
Pennsylvania, g.	Cal	5,150,000	51,500	100	284,925	July 1905	.10
Platteville, l. z.	Wis	20,000	500	40	89,500	Oct. 1905	10.00
Portland, g.	Colo	3,000,000	3,000,000	1	7,417,086	Oct. 1906	.05
Quincy, c.	Mich	2,500,000	100,000	25	16,470,000	Dec. 1906	2.50
Rob Roy, z.	Mo	15,000	15,000	1	9,600	May 1906	.03
Rocco Homest'k,l.s.	Nevada	300,000	300,000	1	112,000	Dec. 1905	.02
Sacramento, g, q.	Utah	5,000,000	1,000,000	1	245,000	Nov. 1906	.00½
Salvator, g. s. l.	Utah	200,000	200,000	1	6,500	Aug. 1904	.01
St. Joseph, l.	Mo	20,000,000	1,000,000	10	4,658,357	June 1906	.15
Silver Hill, g. s.	Nevada	108,000	108,000	1	59,400	Feb. 1906	.05
Silver King, g. s. l.	Utah	3,000,000	150,000	20	10,325,000	Oct. 1906	.33½
Shannon, c.	Ariz	3,000,000	300,000	10	150,000	Dec. 1906	.50
Snowstorm, s. l.	Ida	1,500,000	1,500,000	1	90,000	Oct. 1906	.06
Spearfish, g.	S. D.	1,500,000	1,500,000	1	165,500	Jan. 1905	.01½
Standard Con., g. s.	Cal	2,000,000	178,394	10	4,222,772	Dec. 1906	.10
Stratton'sIndepend	Colo	5,500,000	1,000,007	5	4,895,865	Apr. 1906	.12½
Tamarack, c.	Mich	1,500,000	60,000	25	9,180,000	Jan. 1907	3.00
Tennessee, c.	Tenn	5,000,000	175,000	25	875,000	July 1906	1.25
Tomboy, g. s.	Colo	1,750,000	300,000	5	900,000	June 1906	.48
Tonopah of Nev.	Nevada	1,000,000	1,000,000	1	2,300,000	Oct. 1906	.35
Tonopah Belmont.	Nevada	2,000,000	1,295,007	1	259,000	Jan. 1907	.10
Tonopah Ext'nsion	Nevada	1,000,000	928,438	1	278,530	Apr. 1906	.15
Tonopah Midway.	Nevada	1,000,000	1,000,000	1	300,000	Jan. 1907	.05
Uncle Sam, g.s.l.	Utah	500,000	500,000	1	130 000	Oct. 1906	.01
United Cop. com.	Mont	75,000,000	450,000	100	3,600,000	Oct. 1906	1.75
United, c. pf.	Mont	5,000,000	50,000	100	1,350,000	Nov. 1906	3.00
United, z. l., com.	Mo	500,000	92,400	5	27,450	Oct. 1903	.05
United, z. l., pf.	Mo	500,000	19,556	25	247,680	Jan. 1907	.50
United, (Cripple C'k)	Colo	5,000,000	4,009,100	1	280,071	Apr. 1905	.00½
United Verde, c.	Ariz	3,000,000	300,000	10	17,085,322	Dec. 1904	.75
Un.States,pf.g.s.c.l*	Utah	37,500,000	750,000	50	2,625,000	Jan. 1907	.87½
U.S. Red. & Ref. Pf	Colo	4,000,000	39,458	100	887,805	Jan. 1907	1.50
Utah, g.(Fish Sp'ga)	Utah	1,000,000	100,000	10	240,000	Nov. 1906	.05
Utah Con., c.	Utah	1,500,000	300,000	5	6,036,000	Jan. 1907	3.00
Victoria, Utah.	Utah	250,000	250,000	1	67,000	Dec. 1906	.04
Vindicator Con., g.	Colo	1,500,000	1,500,000	1	1,470,000	July 1906	.03
Wolverine, c.	Mich	1,500,000	60,000	25	3,450,000	Oct. 1906	9.00
Work, g.	Colo	1,500,000	1,500,000	1	75,000	Dec. 1906	.02
Yankee Con.	Utah	500,000	500,000	1	112 500	June 1906	.02½

*Previous to consolidation $1,436,250 were divided.

Coal, Iron and Other Industrials—United States.

Name of Company and Location.		Authorized Capital.	Shares. Issued.	Par Val. $	Dividends. Total to Date.	Latest. Date.	Amt.
Ala. Con., C. & I., pf.	Ala	$2,500,000	24,638	100	$905,265	May 1905	$1.75
Allis-Chalmers, pf.	U. S.	25,000,000	200,000	100	3,213,750	Feb. 1904	1.75
Amer. Ag. Chem., pf.	U. S.	20,000,000	181,530	100	6,831,280	Oct. 1906	3.00
American Cement.	Pa.	2,000,000	200,000	10	1,028,000	Jan. 1907	.40
American Coal.	Md	1,500,000	50,000	25	1,820,000	Sept. 1906	1.25
Associated Oil.	Cal	21,000,000	21,000,000	1	630,000	Aug. 1905	.01½
Bethlehem Steel, pf.	Pa.	15,000,000	150,000	100	900,000	Nov. 1906	.75
Cambria Steel.	Pa.	50,000,000	900,000	50	7,650,000	Oct. 1906	1.00
Caribou Oil.	Cal	100,000	80,000	1	56,000	July 1905	.07
Central C. & C., com.	Mo	5,125,000	51,250	100	1,845, 00	Jan. 1907	1.50
Central C. & C., pf.	Mo	1,875,000	18,750	100	1,242,188	Jan. 1907	1.25
Central Oil	W. Va.	1,500,000	60,000	25	182,500	May 1904	.25
Claremont Oil.	Cal	500,000	450,000	1	58,500	June 1906	.01
Col. & Hock. C. & I.	Ohio	7,000,000	69,244	100	173,086	Feb. 1905	.25
Consolidated Coal	Ill.	5,000,000	50,000	100	350,000	July 1904	1.00
Consolidation Coal.	Md	10,250,000	102,500	100	8,442,900	Oct. 1906	1.50
Crucible Steel, pf.	Pa.	25,000,000	250,000	100	1 000,000	Sept. 1906	1.50
Empire S. & I., pf.	N. J.	5,000,000	25,000	100	637,500	Jan. 1907	3.00
Fairmont Coal.	W. Va.	12,000,000	120,000	100	840,000	Feb. 1906	2.00
Four Oil.	Cal	500,000	300,000	1	105,406	July 1905	.01
General Chem. Com.	U. S.	12,500,000	74,103	100	1,596,919	Sept. 1906	2.00
General Chem., pf.	U. S.	12,500,000	100,000	100	4,375,178	Jan. 1907	1.50
George's C'k Coal	Md	2,500,000	22,000	100	1,188,000	July 1904	3.00
Home Oil.	Cal	100,000	100,000	1	507,500	Oct. 1904	.02½
Ill. Crude Oil	Cal	200,000	200,000	1	12,500	Dec. 1904	.01½
Imperial Oil	Cal	1,000,000	100,000	100	880,000	July 1905	.20
International Salt.		30,000,000	182,280	100	927,060	Dec. 1906	1.00
Jeff. & Cl'f C. & I., cm	Pa.	1,500,000	15,000	100	330,000	Aug. 1905	5.00
Jeff. & Cl'f. C. & I., pf.	Pa.	1,500,000	15,000	100	825,500	Aug. 1906	2.50
Kern River Oil.	Cal	2,000,000	20,000	100	39,500	May 1905	.13
Lehigh Coal & Nav.	Pa.	14,345,650	346,897	50	24,920,891	Nov. 1906	2.00
Maryland Coal,pf.	Md	2,000,000	18,850	100	1,517,160	Dec. 1906	4.00
Monon R. Coal, pf.	Pa.	10,000,000	100,000	100	3,154,945	Jan. 1906	.97
Monte Cristo Oil.	Cal	500,000	500 000	1	120,000	July 1905	.01
National Carbon, pf.	U. S.	4,500,000	45,000	100	2,047,500	May 1905	1.75
National Lead, com.	N. Y.	15,000,000	149,054	100	1,788,648	Jan. 1907	1.00
National Lead, pf.	N. Y.	15,000,000	149,040	100	15,801,688	Dec. 1906	1.75
Nat'l Steel & Wire, pf.	N. Y.	5,000,000	25,778	100	631,561	May 1906	1.75
New Central Coal	Md	1,000,000	50,000	20	330,000	Nov. 1906	.40
New River Coal, pfd.	W. Va.	4,000,000	3,761,700	100	564,255	Nov. 1906	1.50
Pacific Coast Borax.	Cal	2,000,000	19,000	100	2,086,500	Aug. 1905	1.00
Peerless Oil.	Cal	1,000,000	92,000	10	396,320	May 1905	.14
Penna. Salt.	Pa.	3,000,000	60,000	50	13,988,000	Oct. 1905	3.00
Penna. Steel.	Pa.	25,000,000	168,214	100	7,026,995	Nov. 1906	3.50
Phila. Gas, com.	Pa.	28,953,029	579,061	50	6,684,142	Nov. 1905	.75
Phila. Gas, pf.	Pa.	5,744,813	114,896	50	1,583,505	Mar. 1905	1.25
Pittsburg Coal, pf.	Pa.	32,000,000	297,010	100	11,434,962	Apr. 1905	1.75
Pocahontas Coll., pf.	W. Va.	1,500,000	15,000	100	415,000	Nov. 1906	1.50
Republic I. & S., pfd.	Ill.	25,000,000	204,169	100	3,371,282	Jan. 1907	3.75
Sloss-Sheffield, com.	Ala	7,500,000	75,000	100	750,250	Oct. 1906	2.50
Sloss-Sheffield, pf.	Ala	20,000,000	67,000	100	3,093,500	Jan. 1907	1.75
Standard Oil.	U. S.	100,000,000	970,000	100	319,285,000	Dec. 1906	10.00
Tenn. C. & I., com.	Tenn	22,553,600	225,536	100	2,680,889	Nov. 1906	1.00
Tenn. C. & I., pf.	Tenn	248,000	2,480	100	375,130	Nov. 1906	2.00
Texas & Pacific Coal.	Texas	2,000,000	20,000	100	1,930,000	Mar. 1905	2.00
Thirty-three Oil.	Cal	500,000	100,000	5	430,000	July 1905	.10
Union Oil	Cal	10,000,000	100,000	100	1,118,766	May 1905	.50
U. S. SteelCorp.,cm.	U. S.	550,000,000	5,083,025	100	60,985,515	Dec. 1906	.50
U. S. Steel Corp., pf.	U. S.	360,281,100	3,603,141	100	168,539,389	Nov. 1906	1.75
Va. Carolina Ch., pf.	U. S.	20,000,000	180,000	100	11,460,869	Jan. 1907	2.00
Westmoreland Coal.	Pa.	3,000,000	60,000	50	8,580,000	Oct. 1905	2.50

Canada, Mexico, Central and South America.

Name of Company and Location.		Authorized Capital.	Shares. Issued.	Par Val. $	Dividends. Total to Date.	Latest. Date.	Amt.
Amistad y Conc'rdia.	Mex	$480,000	9,600	50	$258,064	Jan. 1905	$1.71
Buffalo, s.	Ont.	1,000,000	900,000	100	14,000	Jan. 1907	.03
Butters' Salvador, g.	Salv	750,000	150,000	5	600,000	Apr. 1905	.25
Cariboo McKin'y, g.	B. C.	1,250,000	1,250,000	1	546,837	Feb. 1904	.04
Consolidated M & S.	B. C.	5,500,000	46,988	100	352,410	Nov. 1906	2.50
Copiapo, c.	Chile	1,125,000	112,500	10	3,000,900	Oct. 1904	1.20½
Crow's Nest Pase	B. C.	3,500,000	140,000	25	1,581,148	Apr. 1906	.62½
Dominion Coal, com.	N. S.	15,000,000	150,000	100	1,050,000	Dec. 1903	1.75
Dominion Coal, pf.	N. S.	3,000,000	30,000	100	3,330,000	Jan. 1905	4.00
Dos Estrellas, g. s.	Mex	150,000	3,000	50	1,020,555	July 1905	13.65
El Oro, g. s.	Mex	5,750,000	1,080,000	5	2,708,800	July 1904	.15
Esperanza, s. g.	Mex	2,275,000	455,000	5	4,373,849	Oct. 1906	2.52
Foster Cobalt, s.	Ont.	1,000,000	1,000,000	1	50,000	Jan. 1907	.05
Granby Con.	B. C.	15,000,000	1,350,000	10	1,753,630	Dec. 1906	.30
Greene Con., copper.	Mex	8,640,000	864,000	10	5,468,600	Nov. 1906	.40
Greene Con., gold.	Mex	5,000,000	500,000	10	300,000	July 1905	.20
Guanajuato.	Mex	3,000,000	540,000	5	74,250	Oct. 1906	.07½
Guggenheim Expl.	Mex	17,000,000	105,000	100	2,910,000	Jan. 1907	2.50
LeRoi No. 2, g.	B. C.	3,000,000	120,000	25	687,600	Oct. 1906	.48
McKinley-Darragh,s.	Ont.	2,500,000	2,000,000	1	60,000	1906	.03
Mexican Coal & Coke	Mex	5,000,000	50,000	100	600,000	Dec. 1905	3.00
Mex. Con. M. & S. Co.	Mex		240,000		480,000	Nov. 1906	.50
Mines Co. of Am.	Mex	2,000,000	2,000,000	1	2,425,000	Dec. 1906	.02
N. Y. & Hond. Ros.	C. A.	1,500,000	150,000	10	2,212,000	Dec. 1906	.20
Nipissing, s.	Ont.	6,000,000	1,200,000	5	780,000	Jan. 1907	.25
North Star.	B. C.	1,500,000	1,300,000	1	351,000	Dec. 1904	1.00
N. S. St. & Coal, com.	N. S.	5,000,000	49,703	100	788,600	Nov. 1904	2.00
N. S. St. & Coal, pf.	N. S.	1,030,000	10,300	100	329,600	July 1906	2.00
Penoles*	Mex	250,000	2,500	100	7,763,375	June 1906	20.00
Platanillo.	Mex	500,000	206,989	1	5,580	Sept. 1906	.00½
Reco, g. s. l.	B. C.	1,000,000	958,000	1	327,082	Apr. 1906	.02
Silver Queen, s.	Ont.	1,500,000	1,500,000	1	130,000	Jan. 1907	.08
Slocan Star.	B. C.	500,000	500,000	1	575,000	Dec. 1904	.08
St. Eugene Con.	B. C.	3,500,000	3,202,000	1	402,120	Oct. 1905	.02
Tezuitlan Copper	Mex	1,000,000	10,000	100		Jan. 1907	2.00
Tilt Cove, c.	N. F.	1,000,000	89,000	2	21,360	Jan. 1905	.48
Tretheway, s.	Ont.	1,000,000	1,000,000	1	40,000	Dec. 1906	.04
Tyee, c.	B. C.	940,000	180,000	5	136,800	Dec. 1904	.24

*Mexican Currency.